

# "DCS" Graduation Project Presentation



Recommendation

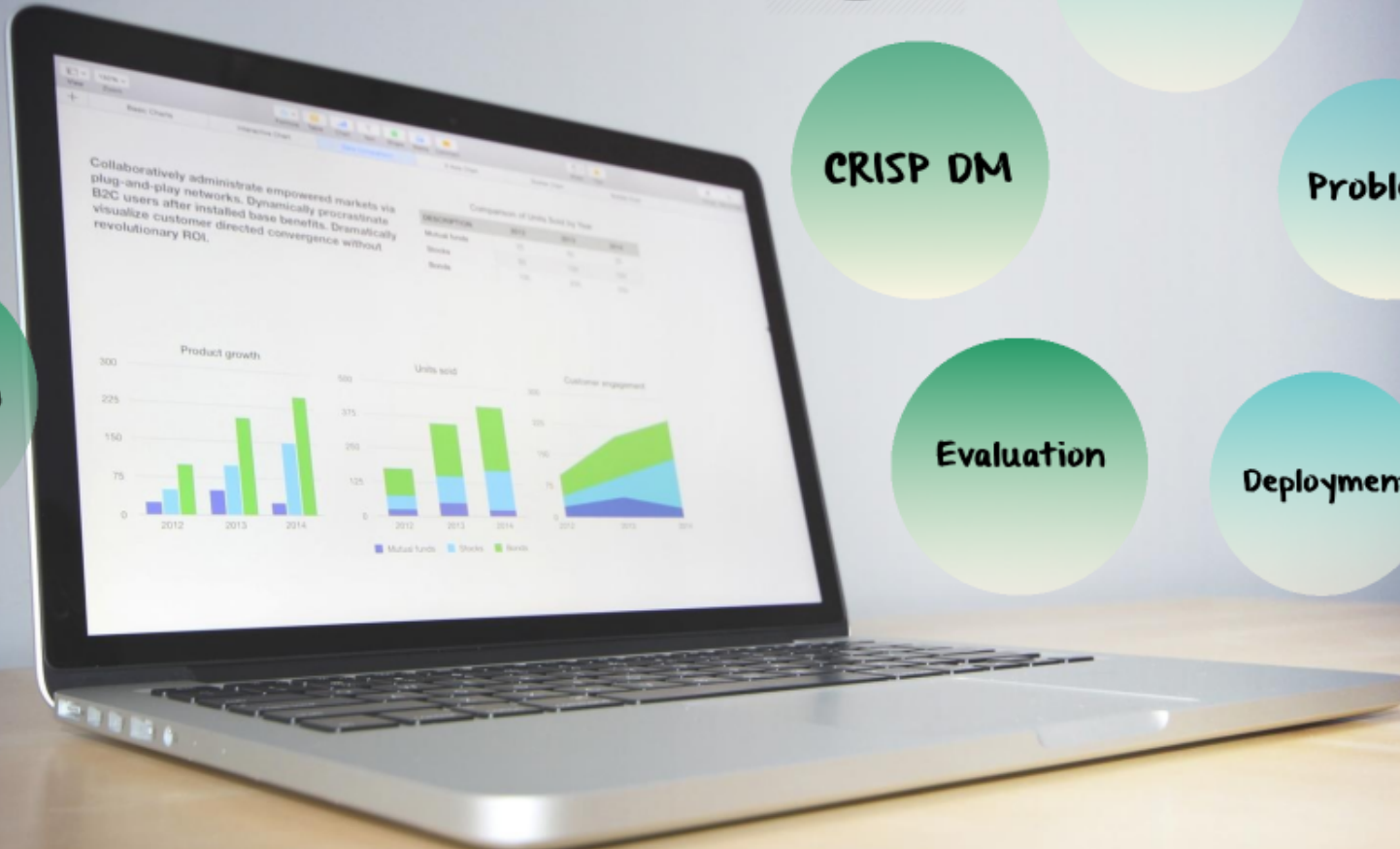
CRISP DM

Problems

Introduction

Evaluation

Deployment



# <Project>

## Data Mining For Community Service Center



Mais Aljabi  
Ruba Shahwan  
Raghad Dalab

Dr. Najwan Delaq  
2018-2019

Overview

Data  
Mining



# <Project>

## Data Mining For Community Service Center



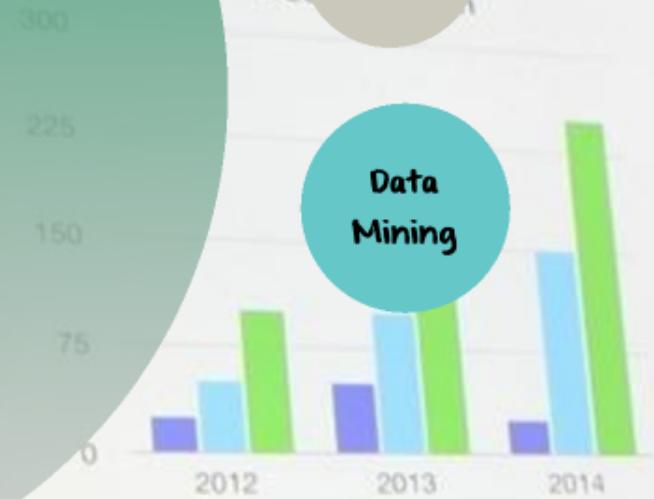
Mais Aljabi  
Ruba Shahwan  
Raghad Dalab

Dr. Najwan Delaq  
2018-2019

users after installed base benefits.  
visualize customer directed convergent  
revolutionary ROI.

Overview

Data  
Mining



# <Project>

## Data Mining For Community Service Center



## our project concept

The project is concerned with the community service center to identify the most important activities . It is useful to analyze the available data to find solutions to the problems and the facilitators to help them complete their tasks and facilitate the creation of information.



## What is Data mining ? and why ?

Data mining is the discovery of interesting, unexpected or valuable structures in large datasets.

Businesses use it to improve marketing strategies, increase sales and decrease costs.

Data mining depends on effective data collection, warehousing and computer processing.



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Recommendation

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Problems

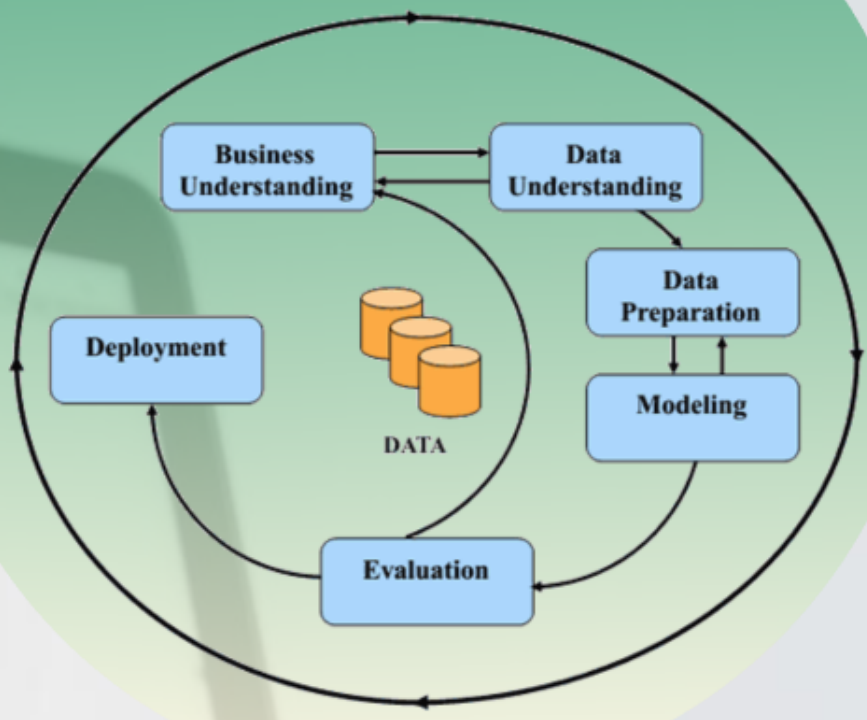
Introduction

Evaluation

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# Cross Industry Standard Process for Data Mining



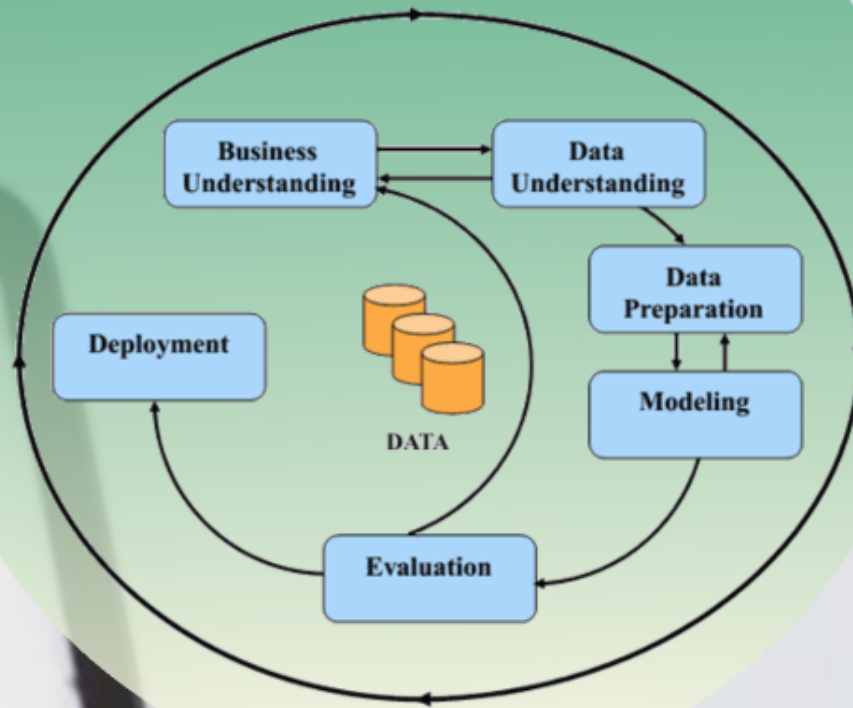
Business Understanding

Data Understanding

Data Preparation

Modeling

## Cross Industry Standard Process for Data Mining



Business Understanding

Data Understanding

Data Preparation

Modeling



**Business  
Understanding**

# Business Understanding

Focuses on understanding the project objectives, Requirements & Project Plan



objective  
1

Objective  
2

objective  
3

Objective  
4

# objective 1

To explore what is the frequency of activities together .



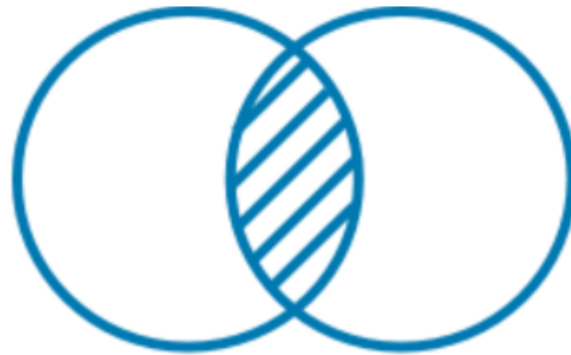
## Objective 2

Predicting the number of notebooks in the next semester .



## Objective 3

Students' similarities .



## Objective 4

Solving the problem in lack of statistical boards



# Data Understanding

- Initial data collection .
- Data Description .
- Data Exploration .



# Data Preparation

To prepare data to be the input for the modeling step , which includes cleaning , transformation , normalization , extract and statistics .



Row data

Rapid miner processes

Results of rapid miner

English Language

Result of converting

data integration

True&False

Classes

Association classes

# Data Preparation

To prepare data to be the input for the modeling step , which includes cleaning , transformation , normalization , extract and statistics .



Row data

Rapid miner processes

Results of rapid miner

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True&False

Classes

Association classes

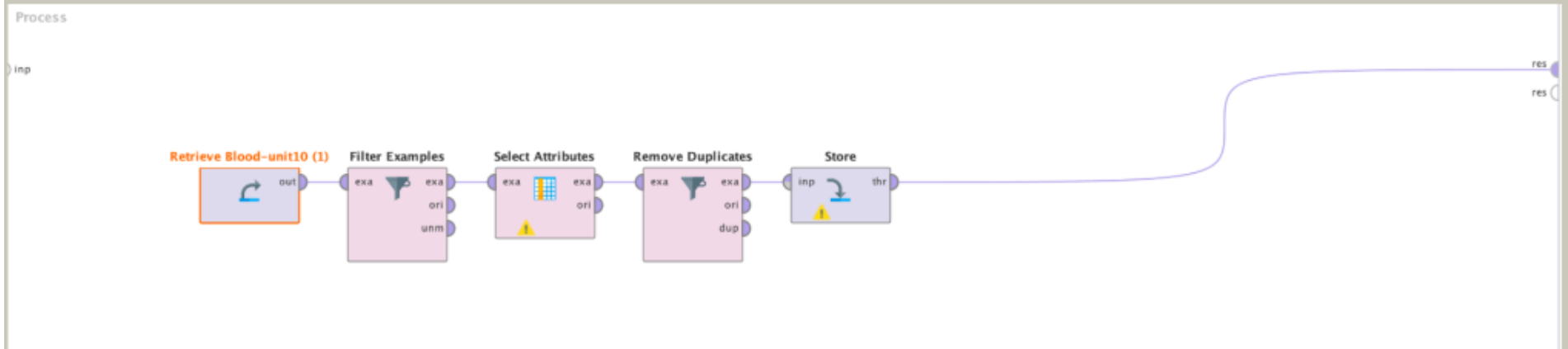
# Example Of Row Data

	M	L	K	J	I	H	G	F	E	D	C	B	A
1							القسم	العمر	رقم الجوال	رقم التسجيل	الرسم	التيكئة	الاسم
2					رسم ١٠	انثى	هندسة معماري	20	568680285	11714925	الرسم	الهندسة	ريا راند رافع عثمان
3					10	انثى	خزف	21	595548516	11614061	الرسم	التقون	إسراء محمد رحمان عبدالجليل صالح
4					10	انثى	طب مخبري	20	598050872	11715399	الرسم	الطب وعلوم الصحة	ماتلكه راند"محمد علي * عابوي
5					10	انثى	خزف	21	599453175	11611391	الرسم	التقون	إسراء عصام مصطفى بدران
6					10	انثى	خزف	20	598535241	11612260	الرسم	التقون	هبة نضال عبدالصمد عكر
7					10	ذكر	هندسة معماري	21	597420131	11524302	الرسم	الهندسة	صمد راند سالم
8					10	انثى	تصميم داخلي	21	599505921	11613706	الرسم	التقون	سجود احمد نديهان صفر
9					10	انثى	خزف	20	569715559	11613859	الرسم	التقون	شرين ازيه علي عيوشي
10					10	انثى	خزف	21	595445142	11613302	الرسم	التقون	روى حلمي محمد حج
11					10	انثى	تصميم داخلي	20	597260128	11524843	الرسم	التقون	مريم بيجوت محمد قزاز
12					10	انثى	خزف	20	595485051	11613655	الرسم	التقون	هبة جمال محمد لحام
13					10	انثى	تصميم داخلي	20	599605466	11612393	الرسم	التقون	سلميل حسين ياسر عبيد
14					10	انثى	تخطيط صراتي	19	599510483	11716173	الرسم	الهندسة	فرح طالب مروان أبو زنت
15					10	انثى	تصميم داخلي	20	598255256	11717784	الرسم	التقون	سيرين ماجد أحمد الأصرح
16					10	انثى	تصميم داخلي	20	595692865	11612629	الرسم	التقون	ندين جميل خميس حمد
17					10	انثى	خزف	20	592718989	11612379	الرسم	التقون	رائيم تومبير حسين سماعة
18					10	انثى	تصميم داخلي	20	595521614	11527067	الرسم	التقون	باسم عبدالله عادل حميدلي
19					10	انثى	تصميم داخلي	20	595904092	11526893	الرسم	التقون	مريم حمد احمد نصاصرة
20					10	انثى	تصميم داخلي	20	598510180	11614049	الرسم	التقون	ضحى محمد خالد ككن
21					10	انثى	تصميم داخلي	20	595566718	11614068	الرسم	التقون	وسن احمد نعيم قرمان
22					10	انثى	تصميم داخلي	21	505987342	11526724	الرسم	التقون	هديل اياب محتشم ترهي
23					10	انثى	تصميم داخلي	20	598712963	11527702	الرسم	التقون	كريسماس شان سعد الله عمرو
24					10	انثى	تصميم داخلي	20	569580865	11613356	الرسم	التقون	آية محمد أحمد حسون
25					10	ذكر	تصميم داخلي	20	502406992	11613539	الرسم	التقون	عثمان علي عبد زيدبات

# Example Of Row Data

	M	L	K	J	I	H	G	F	E	D	C	B	A
1					رسم ١٠	الجنس	القسم	العمر	رقم الجوال	رقم التسجيل	الرسم	التيكئة	الاسم
2					10	انثى	هندسة معماري	20	568680285	11714925	الرسم	الهندسة	ريا راند رافع غلام
3					10	انثى	خزف	21	595548516	11614061	الرسم	التقون	إسراء محمد رضوان عبدالجليل صالح
4					10	انثى	طب مخبري	20	598050872	11715399	الرسم	الطب وعلوم الصحة	ماتلكه راند"محمد علي * عابوي
5					10	انثى	خزف	21	599453175	11611391	الرسم	التقون	إسراء عصام مصطفى بدران
6					10	انثى	خزف	20	598535241	11612260	الرسم	التقون	هيه نضال عبدالصمد عكر
7					10	ذكر	هندسة معماري	21	597420131	11524302	الرسم	الهندسة	صمد راند سالم
8					10	انثى	تصميم داخلي	21	599505921	11613706	الرسم	التقون	سجود احمد نديهان صفر
9					10	انثى	خزف	20	569715559	11613859	الرسم	التقون	شرين ازبه علي عبوشي
10					10	انثى	خزف	21	595445142	11613302	الرسم	التقون	روى حلمي محمد حج
11					10	انثى	تصميم داخلي	20	597260128	11524843	الرسم	التقون	مريم بيجوت محمد قزاز
12					10	انثى	خزف	20	595485051	11613655	الرسم	التقون	هيه جمال محمد لحام
13					10	انثى	تصميم داخلي	20	599605466	11612393	الرسم	التقون	سلميل حسين ياسر عبيد
14					10	انثى	تخطيط صراني	19	599510483	11716173	الرسم	الهندسة	فرح طالب مروان أبو زنت
15					10	انثى	تصميم داخلي	20	598255256	11717784	الرسم	التقون	سيرين ماجد أحمد الأصرح
16					10	انثى	تصميم داخلي	20	595692865	11612629	الرسم	التقون	ندين جميل خميس حمد
17					10	انثى	خزف	20	592718989	11612379	الرسم	التقون	رائيم توبسور حسين سماعة
18					10	انثى	تصميم داخلي	20	595521614	11527067	الرسم	التقون	باسم عبدالله عادل حميدلي
19					10	انثى	تصميم داخلي	20	595904092	11526893	الرسم	التقون	مريم حمد احمد نصاصرة
20					10	انثى	تصميم داخلي	20	598510180	11614049	الرسم	التقون	ضحى محمد خالد ككن
21					10	انثى	تصميم داخلي	20	595566718	11614068	الرسم	التقون	وسن احمد نعيم قرمان
22					10	انثى	تصميم داخلي	21	505987342	11526724	الرسم	التقون	هديل اياب محتمم ترهي
23					10	انثى	تصميم داخلي	20	598712963	11527702	الرسم	التقون	كريسماس شمان سعد الله عمرو
24					10	انثى	تصميم داخلي	20	569580865	11613356	الرسم	التقون	آية محمد أحمد حسون
25					10	ذكر	تصميم داخلي	20	502406992	11613539	الرسم	التقون	عثمان علي عبد زيدبات

# Rapid Miner Processes



# Results of Rapid Miner Cleaning Process

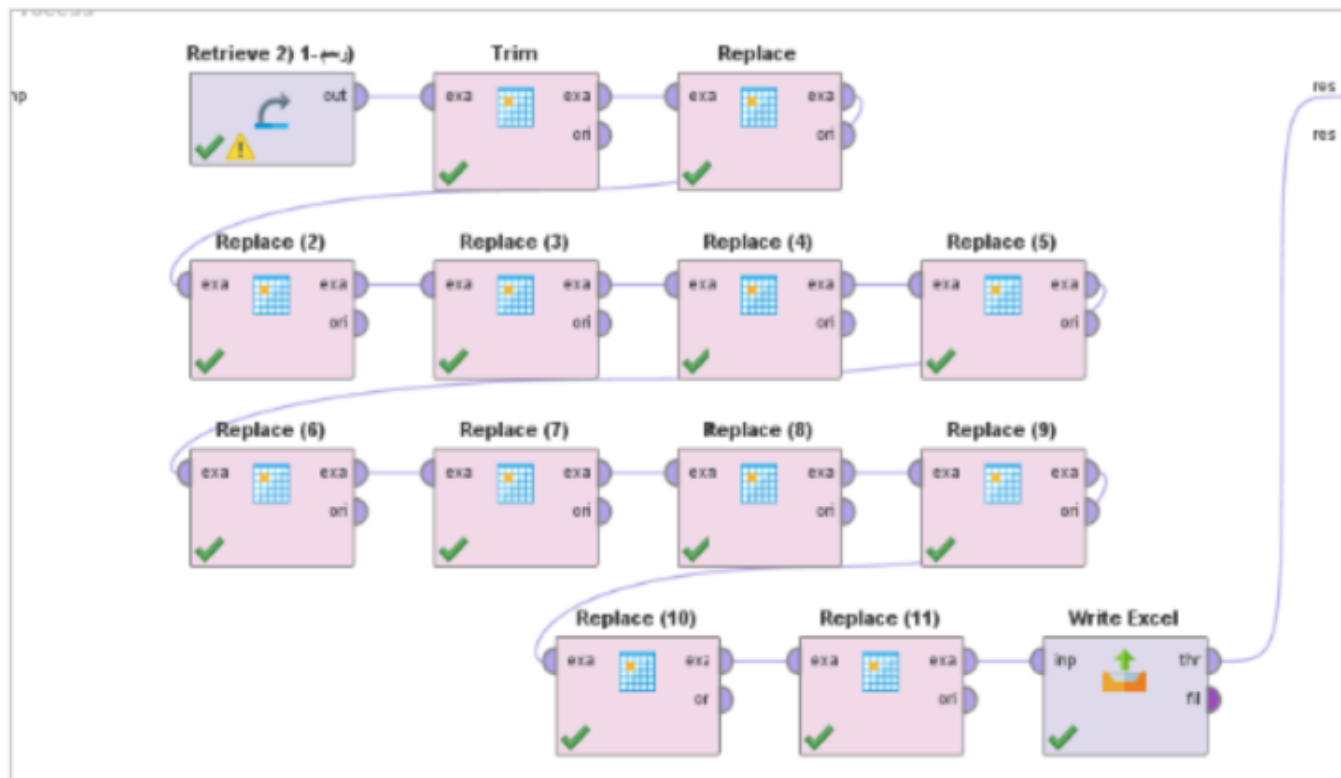
Result History | ExampleSet (Select Attributes (2)) | ExampleSet (/rubashahwan11524294/process/2-رسم)

ExampleSet (51 examples, 0 special attributes, 6 regular attributes) Filter (51 / 51 examples): all

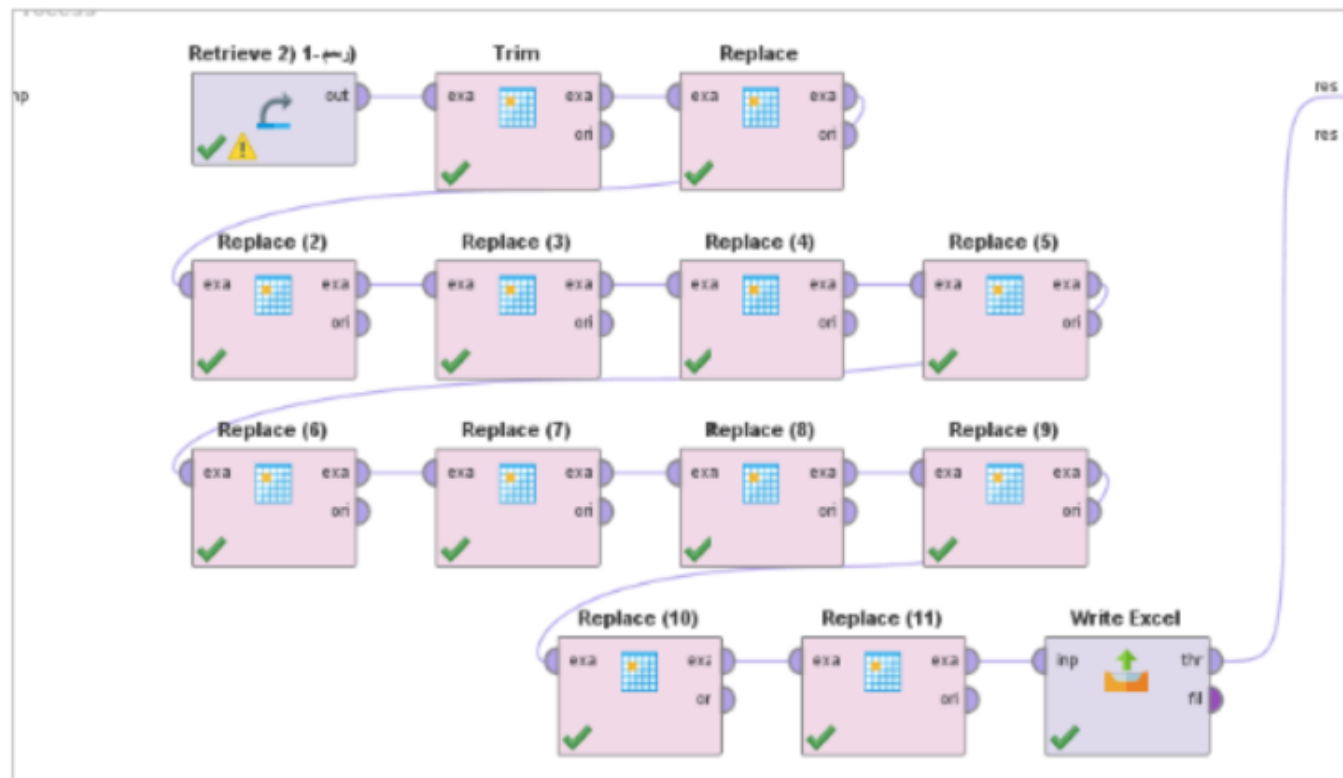
Row No.	الكلمة	رقم التسجيل	العمر	القسم	الجنس	رسم 10
1	الهندسة	11714925	20	هندسة معماري	انثى	10
2	الفنون	11614061	21	حرف	انثى	10
3	الطب وطب الصحة	11715399	20	طب مخبري	ذكر	10
4	الفنون	11611391	21	حرف	ذكر	10
5	الفنون	11612260	20	حرف	انثى	10
6	الهندسة	11524302	21	هندسة معماري	انثى	10
7	الفنون	11613706	21	تصميم داخلي	ذكر	10
8	الفنون	11613859	20	حرف	ذكر	10
9	الفنون	11613302	21	حرف	انثى	10
10	الفنون	11524843	20	تصميم داخلي	ذكر	10
11	الفنون	11613655	20	حرف	ذكر	10
12	الفنون	11612393	20	تصميم داخلي	ذكر	10
13	الهندسة	11716173	19	رسم وتصوير	ذكر	10
14	الفنون	11717784	20	تصميم داخلي	انثى	10
15	الفنون	11612629	20	تصميم داخلي	ذكر	10
16	الفنون	11612379	20	حرف	ذكر	10
17	الفنون	11527067	20	تصميم داخلي	انثى	10

Activate Windows  
Go to Settings to activate Windows.

# Convert data to English Language by Rapid Miner



# Convert data to English Language by Rapid Miner

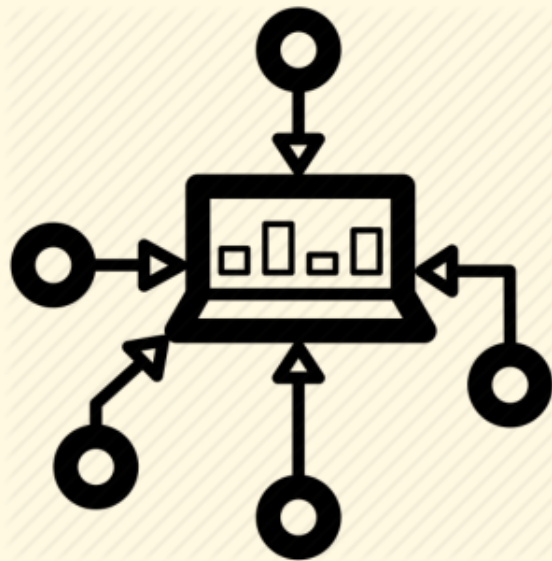


## Result of data after converting to English

	A	B	C	D	E	F
1	<b>id</b>	<b>age</b>	<b>college</b>	<b>section</b>	<b>gender</b>	<b>draw10</b>
2	11421044	20	Art	graphic desig	female	10
3	11524836	21	Art	earthenware	female	10
4	11524886	20	Art	graphic desig	male	10
5	11525722	21	Art	earthenware	male	10
6	11527071	20	Art	earthenware	female	10
7	11541975	21	Art	earthenware	female	10
8	11541994	21	Art	graphic desig	male	10
9	11542250	20	Art	earthenware	male	10
10	11542277	21	Art	earthenware	female	10
11	11610332	20	Art	graphic desig	male	10
12	11610841	20	Art	earthenware	male	10

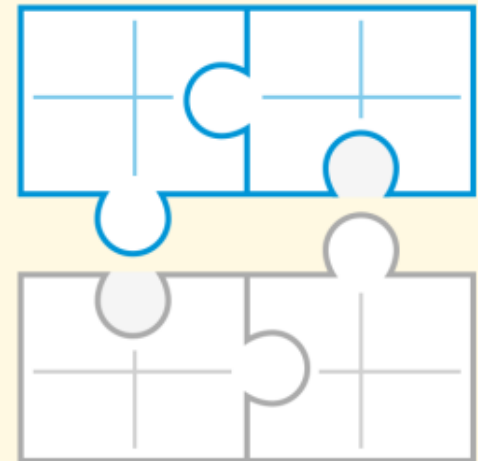
# DATA INTEGRATION

Combine data from disparate sources into meaningful and valuable information .



# Why data integration ?

Merging 12 Excel file into one Excel file without duplication , during data preparation process through " Merge Tables Wizard app"



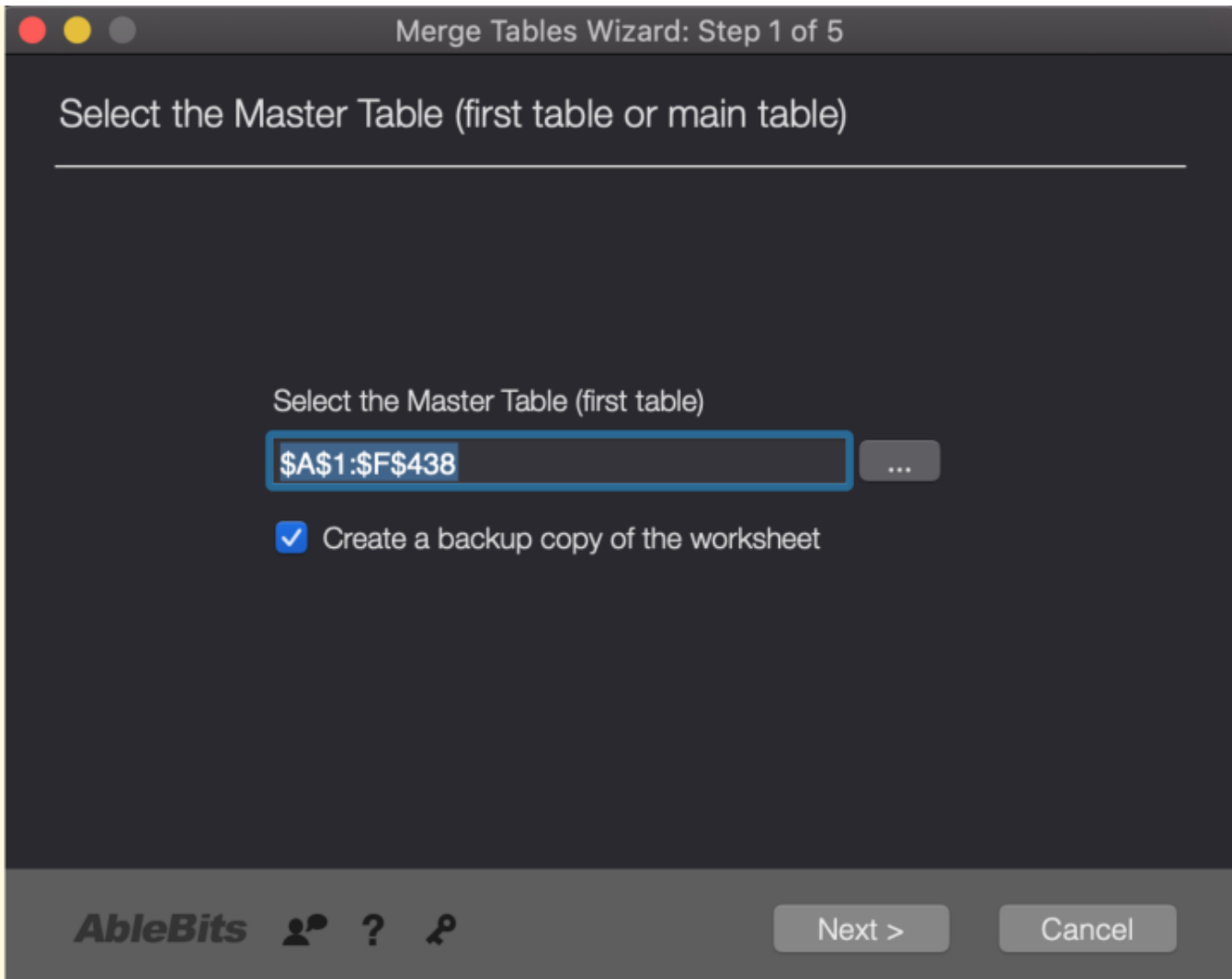
Select the Master Table (first table or main table)

---

Select the Master Table (first table)

...

Create a backup copy of the worksheet



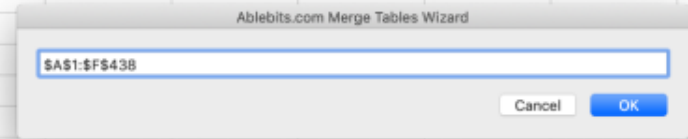
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	<b>id</b>	<b>age</b>	<b>college</b>	<b>section</b>	<b>gender</b>	<b>teaching10</b>							
2	11420370	22	Art	earthenware	male	10							
3	11421044	20	Art	graphic desig	female	10							
4	11422630	22	Art	graphic desig	female	10							
5	11524367	20	Art	earthenware	female	10							
6	11527819	20	Art	graphic desig	female	10							
7	11542199	21	Art	graphic desig	male	10							
8	11610841	20	Art	earthenware	male	10							
9	11610890	20	Art	tsmeem dakt	female	10							
10	11611906	20	Art	earthenware	female	10							
11	11612436	20	Art	graphic desig	male	10							
12	11612709	21	Art	graphic desig	female	10							
13	11613026	20	Art	tsmeem dakt	male	10							
14	11613412	20	Art	draw and pic	male	10							
15	11613541	20	Art	earthenware	male	10							
16	11613761	20	Art	earthenware	female	10							
17	11613933	21	Art	graphic desig	female	10							
18	11614105	20	Art	graphic desig	male	10							
19	11614169	20	Art	graphic desig	female	10							
20	11642979	20	Art	graphic desig	female	10							
21	11715199	19	Art	earthenware	female	10							
22	11717258	19	Art	graphic desig	male	10							
23	11108517	22	Engineering	Architectural	female	10							
24	11211682	24	Engineering	Civil Engineei	female	10							
25	11243921	24	Engineering	Architectural	male	10							
26	11244088	24	Engineering	Building Engi	male	10							
27	11311853	20	Engineering	Architectural	male	10							
28	11315174	23	Engineering	Energy and E	female	10							
29	11315193	21	Engineering	Architectural	female	10							

Ablebits.com Merge Tables Wizard

\$A\$1:\$F\$438

Cancel OK



	A	B	C	D	E	F	G	H	I	J	K	L	M
1	<b>id</b>	<b>age</b>	<b>college</b>	<b>section</b>	<b>gender</b>	<b>teaching10</b>							
2	11420370	22	Art	earthenware	male	10							
3	11421044	20	Art	graphic desig	female	10							
4	11422630	22	Art	graphic desig	female	10							
5	11524367	20	Art	earthenware	female	10							
6	11527819	20	Art	graphic desig	female	10							
7	11542199	21	Art	graphic desig	male	10							
8	11610841	20	Art	earthenware	male	10							
9	11610890	20	Art	tsmeem dakt	female	10							
10	11611906	20	Art	earthenware	female	10							
11	11612436	20	Art	graphic desig	male	10							
12	11612709	21	Art	graphic desig	female	10							
13	11613026	20	Art	tsmeem dakt	male	10							
14	11613412	20	Art	draw and pic	male	10							
15	11613541	20	Art	earthenware	male	10							
16	11613761	20	Art	earthenware	female	10							
17	11613933	21	Art	graphic desig	female	10							
18	11614105	20	Art	graphic desig	male	10							
19	11614169	20	Art	graphic desig	female	10							
20	11642979	20	Art	graphic desig	female	10							
21	11715199	19	Art	earthenware	female	10							
22	11717258	19	Art	graphic desig	male	10							
23	11108517	22	Engineering	Architectural	female	10							
24	11211682	24	Engineering	Civil Engineer	female	10							
25	11243921	24	Engineering	Architectural	male	10							
26	11244088	24	Engineering	Building Engi	male	10							
27	11311853	20	Engineering	Architectural	male	10							
28	11315174	23	Engineering	Energy and E	female	10							
29	11315193	21	Engineering	Architectural	female	10							
30	11316302	23	Engineering	Architectural	male	10							
31	11317360	23	Engineering	Urban planni	male	10							
32	11317704	23	Engineering	Civil Engineer	male	10							
33	11318407	23	Engineering	Energy and E	female	10							



## Select the Lookup Table (second table)

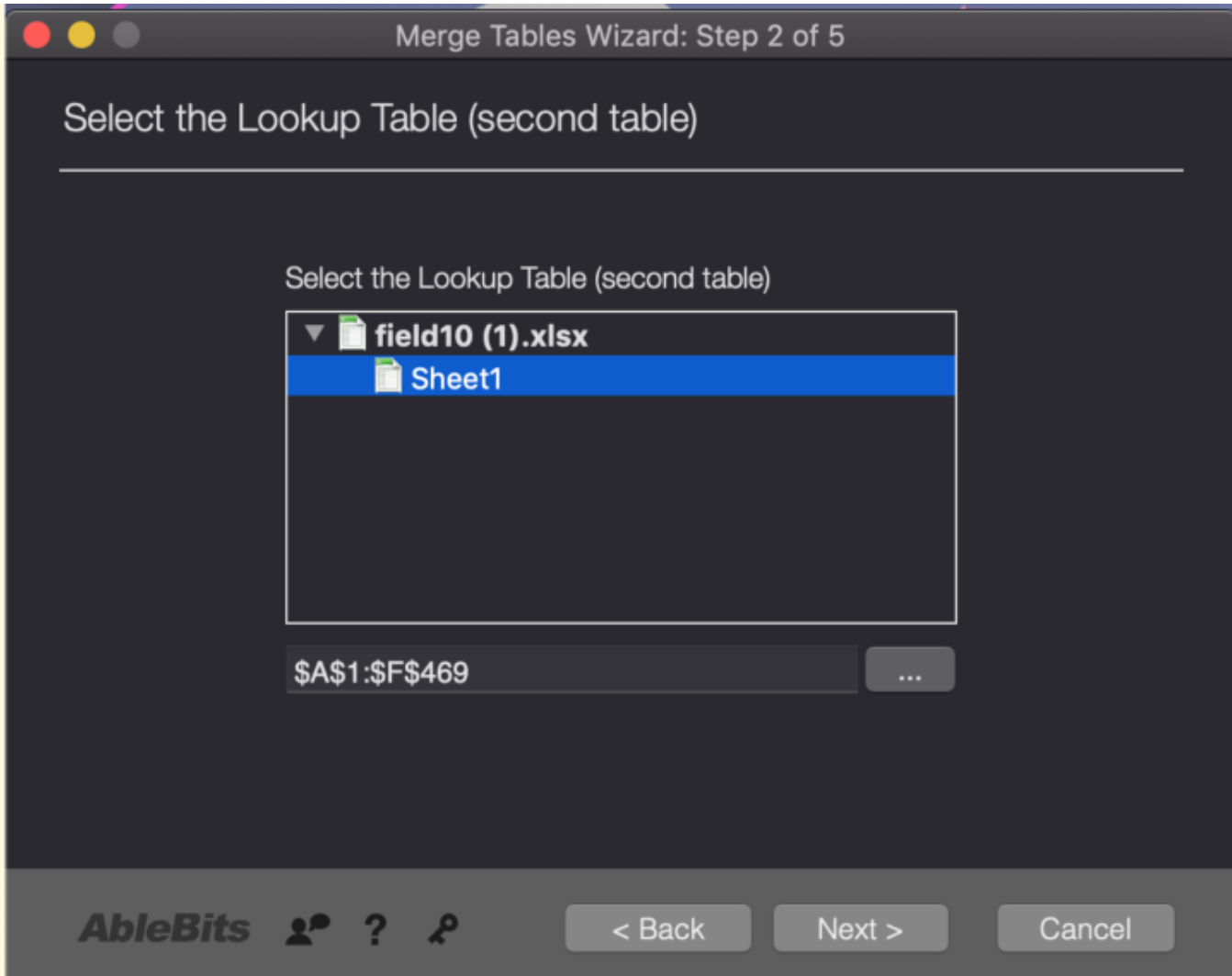
---

Select the Lookup Table (second table)

- ▼  **field10 (1).xlsx**
  -  Sheet1

\$A\$1:\$F\$469





## Select Matching Columns

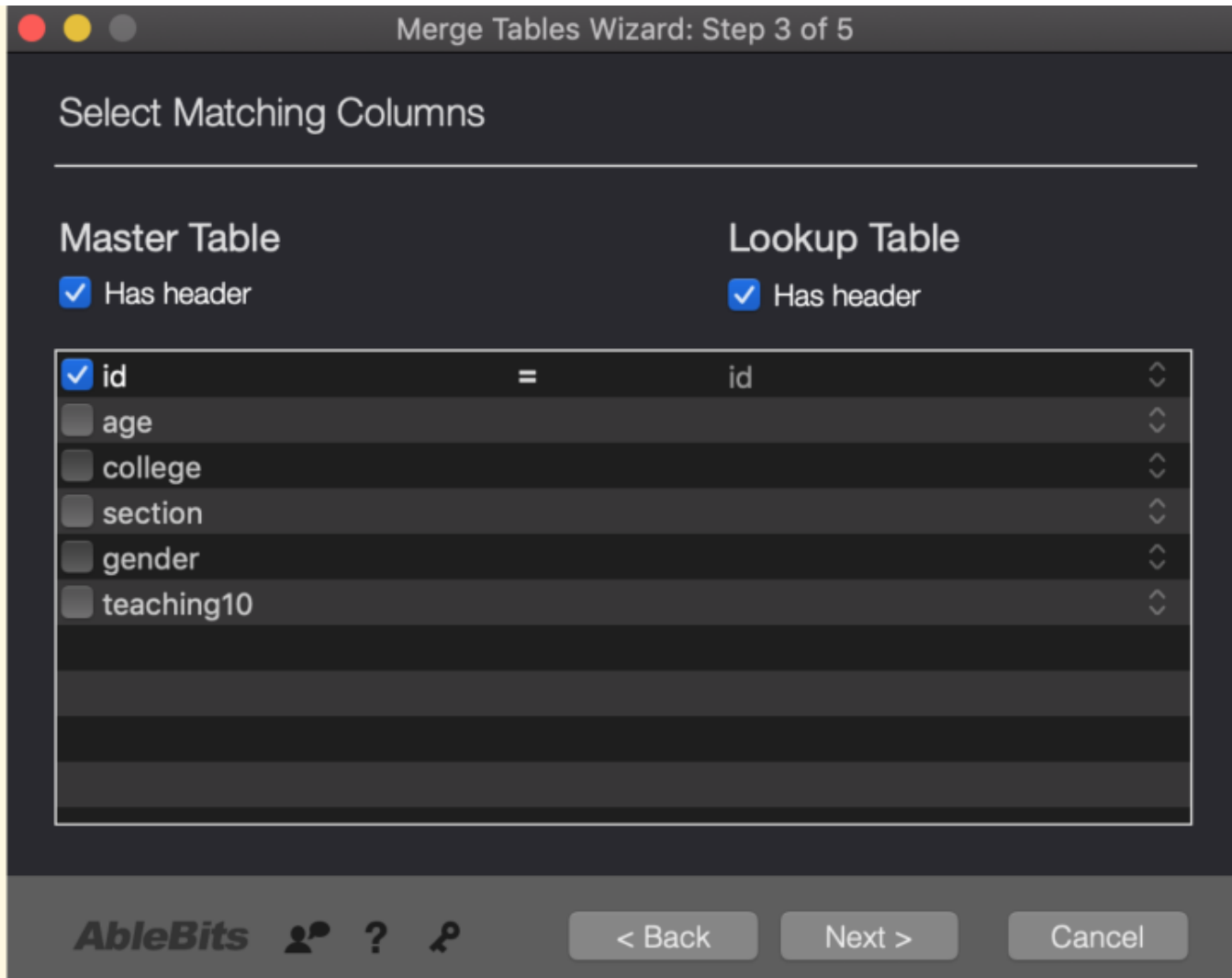
### Master Table

Has header

### Lookup Table

Has header

<input checked="" type="checkbox"/> id	=	id	⌵
<input type="checkbox"/> age			⌵
<input type="checkbox"/> college			⌵
<input type="checkbox"/> section			⌵
<input type="checkbox"/> gender			⌵
<input type="checkbox"/> teaching10			⌵



## Choose Action

### Update values

in Master Table

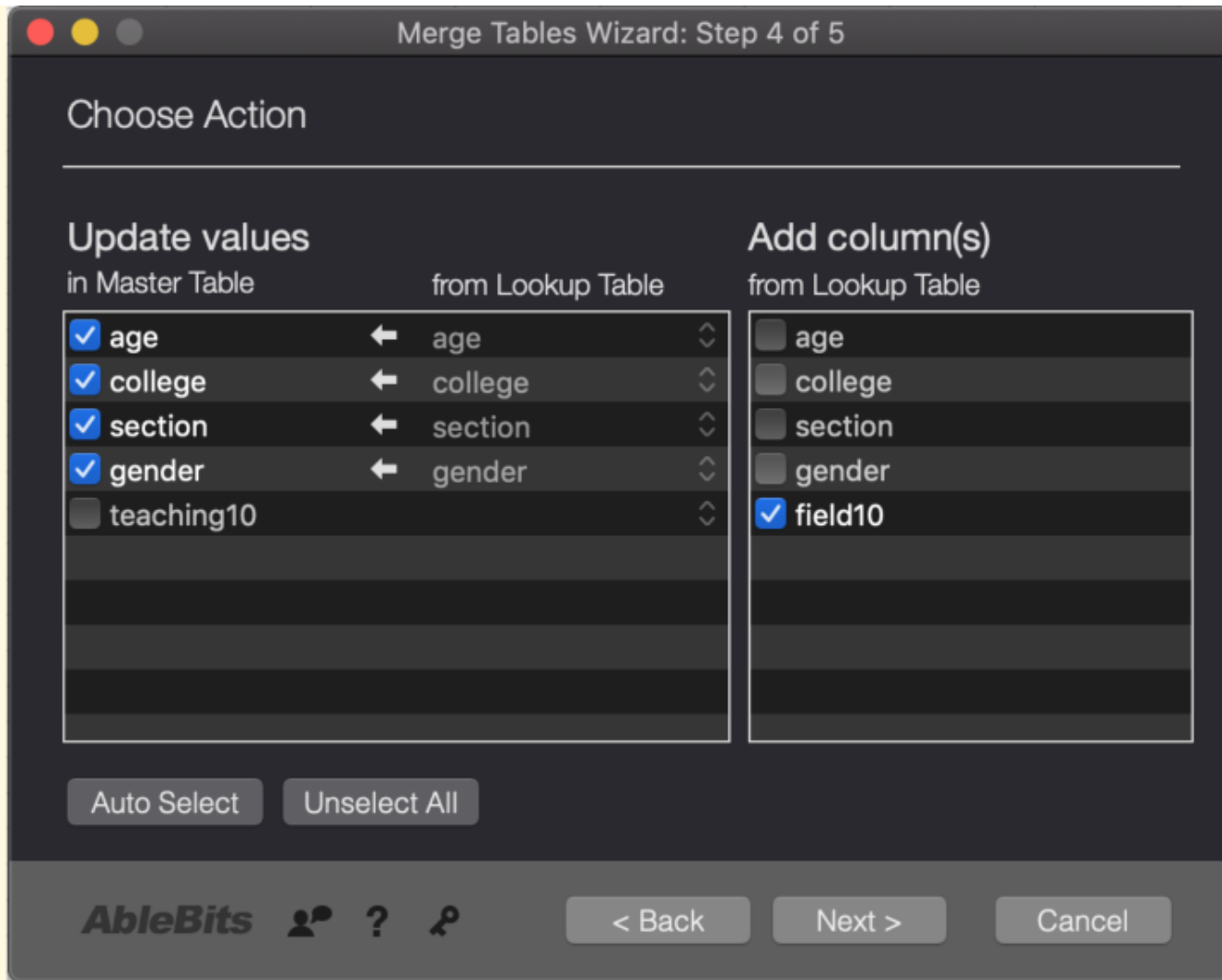
from Lookup Table

<input checked="" type="checkbox"/> age	←	age	∧
<input checked="" type="checkbox"/> college	←	college	∧
<input checked="" type="checkbox"/> section	←	section	∧
<input checked="" type="checkbox"/> gender	←	gender	∧
<input type="checkbox"/> teaching10			∧
			∧
			∧
			∧
			∧

### Add column(s)

from Lookup Table

<input type="checkbox"/> age
<input type="checkbox"/> college
<input type="checkbox"/> section
<input type="checkbox"/> gender
<input checked="" type="checkbox"/> field10



## Additional Options

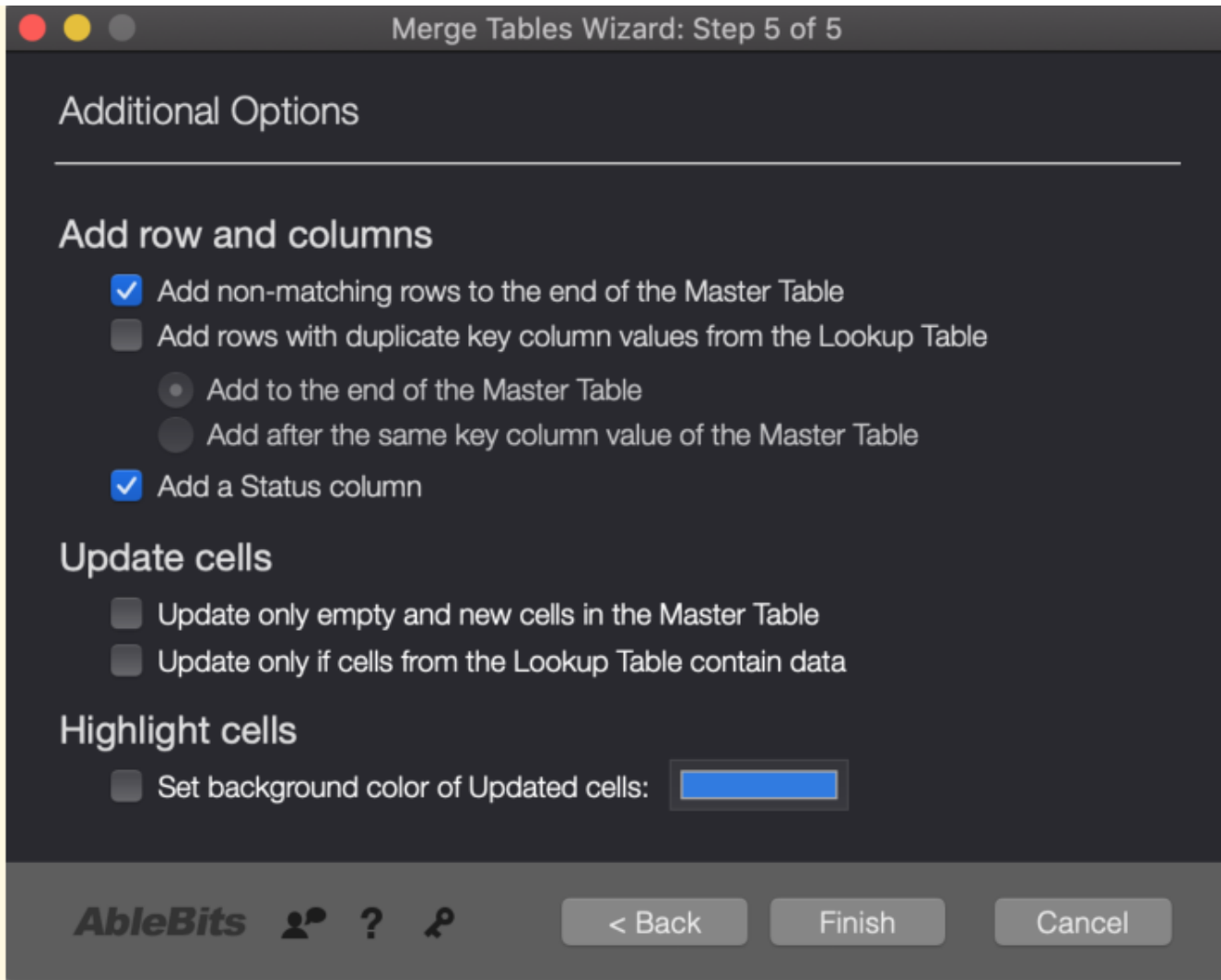
---

### Add row and columns

- Add non-matching rows to the end of the Master Table
- Add rows with duplicate key column values from the Lookup Table
  - Add to the end of the Master Table
  - Add after the same key column value of the Master Table
- Add a Status column

### Update cells

- Update only empty and new cells in the Master Table
- Update only if cells from the Lookup Table contain data



## Results

---

195 of 195 matching rows were found.

4 columns were updated.

1 column was inserted.

273 new rows were added.

## Results

---

195 of 195 matching rows were found.  
4 columns were updated.  
1 column was inserted.  
273 new rows were added.

## Final result of merging first two files .

	A	B	C	D	E	F	G	H
415	11525757	21	Sport	sport	male	10	10	Matching and updated
416	11526039	21	Sport	sport	male	10	10	Matching and updated
417	11526173	21	Sport	sport	female	10		Non-matching
418	11526235	21	Sport	sport	female	10		Non-matching
419	11526705	21	Sport	sport	male	10		Non-matching
420	11527034	21	Sport	sport	female	10	10	Matching and updated
421	11527510	21	Sport	sport	female	10		Non-matching
422	11527516	21	Sport	sport	male	10		Non-matching
423	11527685	21	Sport	sport	male	10	10	Matching and updated
424	11527804	21	Sport	sport	female	10		Non-matching
425	11541369	21	Sport	sport	female	10	10	Matching and updated
426	11541784	21	Sport	sport	female	10		Non-matching
427	11541861	21	Sport	sport	female	10		Non-matching
428	11541894	21	Sport	sport	female	10		Non-matching
429	11542027	21	Sport	sport	male	10	10	Matching and updated
430	11542135	21	Sport	sport	female	10		Non-matching
431	11542223	21	Sport	sport	male	10		Non-matching
432	11542214	21	Sport	sport	male	10		Non-matching

	A	B	C	D	E	F	G	H
415	11525757	21 Sport	sport	male		10	10	Matching and updated
416	11526039	21 Sport	sport	male		10	10	Matching and updated
417	11526173	21 Sport	sport	female		10		Non-matching
418	11526235	21 Sport	sport	female		10		Non-matching
419	11526705	21 Sport	sport	male		10		Non-matching
420	11527034	21 Sport	sport	female		10	10	Matching and updated
421	11527510	21 Sport	sport	female		10		Non-matching
422	11527516	21 Sport	sport	male		10		Non-matching
423	11527685	21 Sport	sport	male		10	10	Matching and updated
424	11527804	21 Sport	sport	female		10		Non-matching
425	11541369	21 Sport	sport	female		10	10	Matching and updated
426	11541784	21 Sport	sport	female		10		Non-matching
427	11541861	21 Sport	sport	female		10		Non-matching
428	11541894	21 Sport	sport	female		10		Non-matching
429	11542027	21 Sport	sport	male		10	10	Matching and updated
430	11542135	21 Sport	sport	female		10		Non-matching
431	11542223	21 Sport	sport	male		10		Non-matching
432	11542214	21 Sport	sport	male		10		Non-matching
433	11610040	21 Sport	sport	female		10		Non-matching
434	11610073	20 Sport	sport	female		10		Non-matching
435	11610101	20 Sport	sport	female		10		Non-matching
436	11610240	20 Sport	sport	female		10	10	Matching and updated
437	11610188	20 Sport	sport	female		10	10	Matching and updated
438	11610404	20 Sport	sport	female		10		Non-matching
439	11420370	22 Art	earthenware	male			10	New row
440	11524367	20 Art	earthenware	female			10	New row
441	11610890	20 Art	tsmeem dakt	female			10	New row
442	11613026	20 Art	tsmeem dakt	male			10	New row
443	11613412	20 Art	draw and pic	male			10	New row
444	11613541	20 Art	earthenware	male			10	New row

# To get this final data or result .

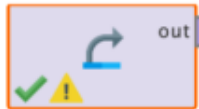
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	id	age	college	section	gender	notebook10	notebook20	teaching10	teaching20	field10	field20	Blood unit10	Blood unit20	print20	orphan50
2	11243918	24	Art	earthenware	male	0	0	0	0	10	0	0	20	0	0
3	11420370	22	Art	earthenware	male	10	0	10	0	0	0	10	0	0	0
4	11421044	20	Art	graphic design	female	0	20	10	0	10	0	0	0	0	0
5	11422630	22	Art	graphic design	female	10	0	10	0	10	0	0	20	0	0
6	11523685	21	Art	earthenware	male	10	0	0	20	0	20	0	0	0	0
7	11523695	21	Art	graphic design	female	10	0	0	0	0	0	0	0	20	0
8	11524367	20	Art	earthenware	female	0	0	10	0	0	0	0	0	20	20
9	11524366	21	Art	graphic design	female	0	20	0	20	0	0	10	0	0	0
10	11524836	21	Art	earthenware	female	0	20	0	20	0	0	0	0	0	0
11	11524886	20	Art	graphic design	male	10	0	0	20	0	0	10	0	0	0
12	11525670	21	Art	earthenware	female	10	0	0	0	0	20	0	20	0	0
13	11525722	21	Art	earthenware	male	0	0	0	20	0	20	0	0	0	0
14	11526762	20	Art	graphic design	male	10	0	0	0	0	20	0	20	0	0
15	11526939	21	Art	graphic design	female	0	0	0	20	0	0	10	0	20	0
16	11527071	20	Art	earthenware	female	0	20	0	20	0	0	0	0	0	0
17	11527507	21	Art	earthenware	female	0	0	0	0	0	20	10	0	0	0
18	11527624	20	Art	earthenware	female	0	0	0	0	10	0	0	20	0	0
19	11527819	20	Art	graphic design	female	10	0	10	0	10	0	0	0	0	0
20	11541975	21	Art	earthenware	female	0	20	0	0	10	0	10	0	0	0
21	11541994	21	Art	graphic design	male	0	20	0	20	0	0	0	0	0	0
22	11542199	21	Art	graphic design	male	0	20	10	0	10	0	10	0	0	0
23	11542250	20	Art	earthenware	male	10	0	0	20	0	0	10	0	0	0
24	11542277	21	Art	earthenware	female	10	0	0	0	0	20	10	0	0	0
25	11610332	20	Art	graphic design	male	10	0	0	0	0	20	10	0	0	0
26	11610841	20	Art	earthenware	male	0	0	10	0	10	0	0	20	0	0
27	11610890	20	Art	tsmeem dakhele	female	10	0	10	0	0	0	10	0	0	0
28	11611906	20	Art	earthenware	female	10	0	10	0	10	0	0	0	0	20
29	11611996	20	Art	graphic design	female	10	0	0	0	0	0	0	20	0	0
30	11612407	22	Art	earthenware	female	0	0	0	20	10	0	0	0	0	0

# Turn the data from numerical to nominal "TRUE & FALSE".

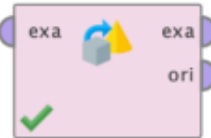
	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	college	section	gender	notebook10	notebook20	teaching10	teaching20	field10	field20	Blood unit10	Blood unit20	print20	orphan50	draw10	draw20
2	Art	earthenware	male	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE
3	Art	earthenware	male	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE
4	Art	graphic design	female	FALSE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
5	Art	graphic design	female	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
6	Art	earthenware	male	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
7	Art	graphic design	female	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE
8	Art	earthenware	female	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE
9	Art	graphic design	female	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
10	Art	earthenware	female	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
11	Art	graphic design	male	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE
12	Art	earthenware	female	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
13	Art	earthenware	male	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
14	Art	graphic design	male	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
15	Art	graphic design	female	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE
16	Art	earthenware	female	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
17	Art	earthenware	female	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE
18	Art	earthenware	female	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE
19	Art	graphic design	female	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
20	Art	earthenware	female	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE
21	Art	graphic design	male	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
22	Art	graphic design	male	FALSE	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
23	Art	earthenware	male	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE
24	Art	earthenware	female	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE
25	Art	graphic design	male	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE
26	Art	earthenware	male	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE
27	Art	tsmeem dakhele	female	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE
28	Art	earthenware	female	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
29	Art	graphic design	female	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE
30	Art	earthenware	female	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE

# Process via rapid miner

Retrieve the merged file



Numerical to Binom...



res

res

# Convert Data to Classes

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	id	age	college	section	gender	notebook10	notebook20	teaching10	teaching20	field10	field20	Blood unit10	Blood unit20	print20	orphan50	draw10	draw20	CLASS
2	11243918	24	Art	earthenware	male	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	EHL
3	11420370	22	Art	earthenware	male	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	ACGL
4	11421044	20	Art	graphic design	female	FALSE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	BCEK
5	11422630	22	Art	graphic design	female	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	ACEH
6	11523685	21	Art	earthenware	male	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	ADF
7	11523695	21	Art	graphic design	female	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	AHL
8	11524367	20	Art	earthenware	female	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	CHI
9	11524366	21	Art	graphic design	female	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	BDG
10	11524836	21	Art	earthenware	female	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	BDK
11	11524886	20	Art	graphic design	male	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	ADGK
12	11525670	21	Art	earthenware	female	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	AFH
13	11525722	21	Art	earthenware	male	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	DFK
14	11526762	20	Art	graphic design	male	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	AFH
15	11526939	21	Art	graphic design	female	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	DGI
16	11527071	20	Art	earthenware	female	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	BDK
17	11527507	21	Art	earthenware	female	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FGL
18	11527624	20	Art	earthenware	female	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	EHL
19	11527819	20	Art	graphic design	female	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	ACEL
20	11541975	21	Art	earthenware	female	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	TRUE	BEGK
21	11541994	21	Art	graphic design	male	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	BDK
22	11542199	21	Art	graphic design	male	FALSE	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	BCEG
23	11542250	20	Art	earthenware	male	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	ADGK
24	11542277	21	Art	earthenware	female	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	AFGK
25	11610332	20	Art	graphic design	male	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	AFGK
26	11610841	20	Art	earthenware	male	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	CEHK
27	11610890	20	Art	tsmeem dakhele	female	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	ACGL
28	11611906	20	Art	earthenware	female	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	ACEI
29	11611996	20	Art	graphic design	female	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	AHL
30	11612407	22	Art	earthenware	female	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	DEL
31	11612436	20	Art	graphic design	male	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	ACEGK
32	11612500	19	Art	draw and pic	male	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	BEGK
33	11612658	20	Art	earthenware	male	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	AFH
34	11612709	21	Art	graphic design	female	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	ACEL
35	11613026	20	Art	tsmeem dakhele	male	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	BCL
36	11613271	20	Art	draw and pic	female	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	DFG
37	11613257	20	Art	draw and pic	male	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	EHL
38	11613412	20	Art	draw and pic	male	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	CFL
39	11613471	20	Art	tsmeem dakhele	female	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	DFK

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	id	age	college	section	gender	notebook10	notebook20	teaching10	teaching20	field10	field20	Blood unit10	Blood unit20	print20	orphan50	draw10	draw20	CLASS
2	11243918	24	Art	earthenware	male	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	EHL
3	11420370	22	Art	earthenware	male	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	ACGL
4	11421044	20	Art	graphic design	female	FALSE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	BCEK
5	11422630	22	Art	graphic design	female	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	ACEH
6	11523685	21	Art	earthenware	male	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	ADF
7	11523695	21	Art	graphic design	female	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	AHL
8	11524367	20	Art	earthenware	female	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	CHI
9	11524366	21	Art	graphic design	female	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	BDG
10	11524836	21	Art	earthenware	female	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	BDK
11	11524886	20	Art	graphic design	male	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	ADGK
12	11525670	21	Art	earthenware	female	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	AFH
13	11525722	21	Art	earthenware	male	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	DFK
14	11526762	20	Art	graphic design	male	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	AFH
15	11526939	21	Art	graphic design	female	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	DGI
16	11527071	20	Art	earthenware	female	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	BDK
17	11527507	21	Art	earthenware	female	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FGL
18	11527624	20	Art	earthenware	female	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	EHL
19	11527819	20	Art	graphic design	female	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	ACEL
20	11541975	21	Art	earthenware	female	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	BEGK
21	11541994	21	Art	graphic design	male	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	BDK
22	11542199	21	Art	graphic design	male	FALSE	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	BCEG
23	11542250	20	Art	earthenware	male	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	ADGK
24	11542277	21	Art	earthenware	female	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	AFGK
25	11610332	20	Art	graphic design	male	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	AFGK
26	11610841	20	Art	earthenware	male	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	CEHK
27	11610890	20	Art	tsmeem dakhele	female	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	ACGL
28	11611906	20	Art	earthenware	female	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	ACEI
29	11611996	20	Art	graphic design	female	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	AHL
30	11612407	22	Art	earthenware	female	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	DEL
31	11612436	20	Art	graphic design	male	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	ACEGK
32	11612500	19	Art	draw and pic	male	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	BEGK
33	11612658	20	Art	earthenware	male	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	AFH
34	11612709	21	Art	graphic design	female	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	ACEL
35	11613026	20	Art	tsmeem dakhele	male	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	BCL
36	11613271	20	Art	draw and pic	female	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	DFG
37	11613257	20	Art	draw and pic	male	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	EHL
38	11613412	20	Art	draw and pic	male	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	CFL
39	11613471	20	Art	tsmeem dakhele	female	FALSE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	DFK
40	11613465	20	Art	graphic design	female	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	EHL
41	11613532	20	Art	tsmeem dakhele	male	TRUE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	ADEK
42	11613541	20	Art	earthenware	male	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	CFGK
43	11613565	20	Art	graphic design	female	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	BHK
44	11613635	20	Art	tsmeem dakhele	female	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	AFL
45	11613577	20	Art	tsmeem dakhele	female	FALSE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	BFGK



P	Q	R	S	T	U	V	W
<b>draw10</b>	<b>draw20</b>	<b>CLASS</b>					
FALSE	TRUE	=IF(F2<>FALSE,"A",&IF(G2<>FALSE,"B",&IF(H2<>FALSE,"C",&IF(I2<>FALSE,"D",&IF(J2<>FALSE,"E",&IF(K2<>FALSE,"F",&IF(L2<>FALSE,"G",&IF(M2<>FALSE,"H",&IF(N2<>FALSE,"I",&IF(O2<>FALSE,"J",&IF(P2<>FALSE,"K",&IF(Q2<>FALSE,"L",&					
FALSE	TRUE						
TRUE	FALSE						
FALSE	FALSE						
FALSE	FALSE	ADF					
FALSE	TRUE	AHL					
FALSE	FALSE	CHI					
FALSE	FALSE	BDG					
TRUE	FALSE	BDK					
TRUE	FALSE	ADGK					
FALSE	FALSE	AFH					
TRUE	FALSE	DFK					
FALSE	FALSE	AFH					
FALSE	FALSE	DGI					
TRUE	FALSE	BDK					

## The result after deleting the activities columns

	A	B	C	D	E	F
1	<b>id</b>	<b>age</b>	<b>college</b>	<b>section</b>	<b>gender</b>	<b>CLASS</b>
2	11243918	24	Art	earthenware	male	EHL
3	11420370	22	Art	earthenware	male	ACGL
4	11421044	20	Art	graphic design	female	BCEK
5	11422630	22	Art	graphic design	female	ACEH
6	11523685	21	Art	earthenware	male	ADF
7	11523695	21	Art	graphic design	female	AHL
8	11524367	20	Art	earthenware	female	CHI
9	11524366	21	Art	graphic design	female	BDG
10	11524836	21	Art	earthenware	female	BDK
11	11524886	20	Art	graphic design	male	ADGK
12	11525670	21	Art	earthenware	female	AEH

	A	B	C	D	E	F
1	<b>id</b>	<b>age</b>	<b>college</b>	<b>section</b>	<b>gender</b>	<b>CLASS</b>
2	11243918	24	Art	earthenware	male	EHL
3	11420370	22	Art	earthenware	male	ACGL
4	11421044	20	Art	graphic design	female	BCEK
5	11422630	22	Art	graphic design	female	ACEH
6	11523685	21	Art	earthenware	male	ADF
7	11523695	21	Art	graphic design	female	AHL
8	11524367	20	Art	earthenware	female	CHI
9	11524366	21	Art	graphic design	female	BDG
10	11524836	21	Art	earthenware	female	BDK
11	11524886	20	Art	graphic design	male	ADGK
12	11525670	21	Art	earthenware	female	AFH
13	11525722	21	Art	earthenware	male	DFK

# Classes with the highest support

No.	Premises	Conclusion	Support	Confidence	LaPlace	Gain	p-s	Lift	Convic...
57	notebook10, Blood unit10	draw10	0.100	0.732	0.968	-0.174	0.056	2.277	2.530
58	notebook10, draw10	Blood unit10	0.100	0.750	0.971	-0.167	0.063	2.661	2.872
59	notebook20, draw10, teaching10	field10	0.033	0.754	0.990	-0.054	0.019	2.411	2.792
60	notebook10, Blood unit10, teaching20	draw10	0.033	0.758	0.990	-0.055	0.019	2.358	2.800
61	draw20, teaching20	notebook10	0.036	0.761	0.989	-0.059	0.018	1.990	2.581
62	teaching10, Blood unit10, print20	field10	0.017	0.765	0.995	-0.028	0.010	2.446	2.921
63	notebook20, draw20	teaching10	0.044	0.767	0.987	-0.071	0.027	2.629	3.045
64	Blood unit20, field20	notebook10	0.038	0.781	0.990	-0.059	0.019	2.044	2.819
65	notebook10, field10, draw20	teaching10	0.025	0.787	0.994	-0.038	0.016	2.697	3.328
66	notebook20, teaching10, Blood unit10	draw10	0.011	0.842	0.998	-0.015	0.007	2.621	4.298
67	notebook10, draw10, field20	Blood unit10	0.045	0.872	0.994	-0.059	0.031	3.093	5.601
68	field10, Blood unit10, teaching20	notebook10	0.011	0.889	0.999	-0.013	0.006	2.326	5.561
69	notebook20, field10, teaching10	draw10	0.033	0.907	0.997	-0.039	0.021	2.824	7.330
70	draw10, field10, teaching20	notebook10	0.013	0.909	0.999	-0.016	0.008	2.379	6.797
71	notebook20, field10, Blood unit10	draw10	0.024	0.923	0.998	-0.028	0.016	2.873	8.823
72	draw10, Blood unit10, field20	notebook10	0.045	0.932	0.997	-0.052	0.027	2.438	9.021
73	draw10, Blood unit10, teaching20	notebook10	0.033	0.962	0.999	-0.036	0.020	2.516	16.065

No.	Premises	Conclusion	Support	Confidence	LaPlace	Gain	p-s	Lift	Convic...
57	notebook10, Blood unit10	draw10	0.100	0.732	0.968	-0.174	0.056	2.277	2.530
58	notebook10, draw10	Blood unit10	0.100	0.750	0.971	-0.167	0.063	2.661	2.872
59	notebook20, draw10, teaching10	field10	0.033	0.754	0.990	-0.054	0.019	2.411	2.792
60	notebook10, Blood unit10, teaching20	draw10	0.033	0.758	0.990	-0.055	0.019	2.358	2.800
61	draw20, teaching20	notebook10	0.036	0.761	0.989	-0.059	0.018	1.990	2.581
62	teaching10, Blood unit10, print20	field10	0.017	0.765	0.995	-0.028	0.010	2.446	2.921
63	notebook20, draw20	teaching10	0.044	0.767	0.987	-0.071	0.027	2.629	3.045
64	Blood unit20, field20	notebook10	0.038	0.781	0.990	-0.059	0.019	2.044	2.819
65	notebook10, field10, draw20	teaching10	0.025	0.787	0.994	-0.038	0.016	2.697	3.328
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73	draw10, Blood unit10, teaching20	notebook10	0.033	0.962	0.999	-0.036	0.020	2.516	16.065
74	field10, Blood unit10, print20	teaching10	0.017	0.963	0.999	-0.019	0.012	3.299	19.118
75	notebook10, draw10, Blood unit20	teaching10	0.008	1	1	-0.008	0.006	3.426	∞
76	notebook10, teaching10, field20	draw10	0.007	1	1	-0.007	0.005	3.112	∞
77	notebook10, Blood unit10, field20	draw10	0.045	1	1	-0.045	0.031	3.112	∞
78	notebook10, field10, Blood unit20	teaching10	0.015	1	1	-0.015	0.010	3.426	∞
79	field10, teaching10, draw20	notebook10	0.025	1	1	-0.025	0.015	2.617	∞
80	field10, Blood unit10, draw20	notebook10	0.007	1	1	-0.007	0.004	2.617	∞
81	teaching10, Blood unit10, draw20	notebook10	0.014	1	1	-0.014	0.009	2.617	∞
82	notebook10, Blood unit10, print20	teaching10	0.005	1	1	-0.005	0.004	3.426	∞
83	draw10, field10, Blood unit20	teaching10	0.009	1	1	-0.009	0.006	3.426	∞
84	notebook10, draw10, field10, teaching10	Blood unit10	0.021	1	1	-0.021	0.015	3.547	∞
85	notebook10, draw10, field10, Blood unit10	teaching10	0.021	1	1	-0.021	0.015	3.426	∞
86	notebook10, draw10, teaching10, Blood unit10	field10	0.021	1	1	-0.021	0.015	3.199	∞
87	notebook10, field10, teaching10, Blood unit10	draw10	0.021	1	1	-0.021	0.015	3.112	∞
88	draw10, field10, teaching10, Blood unit10	notebook10	0.021	1	1	-0.021	0.013	2.617	∞

iv	0.007	1	1	-0.007	0.003	3.11
10	0.045	1	1	-0.045	0.031	3.11
ing10	0.015	1	1	-0.015	0.010	3.42
ook10	0.025	1	1	-0.025	0.015	2.61
ook10	0.007	1	1	-0.007	0.004	2.61
ook10	0.014	1	1	-0.014	0.009	2.61
ing10	0.005	1	1	-0.005	0.004	3.42
ing10	0.009	1	1	-0.009	0.006	3.42
unit10	0.021	1	1	-0.021	0.015	3.54
ing10	0.021	1	1	-0.021	0.015	3.42
.0	0.021	1	1	-0.021	0.015	3.19
10	0.021	1	1	-0.021	0.015	3.11
ook10	0.021	1	1	-0.021	0.013	2.61

# Association "classes"

We take the highest support for the last 11 rows then we remove the duplicate class so the final result is **7 classes**.

# Modeling

Basket Market Analysis & Decision Tree Processes  
via Rapid Miner

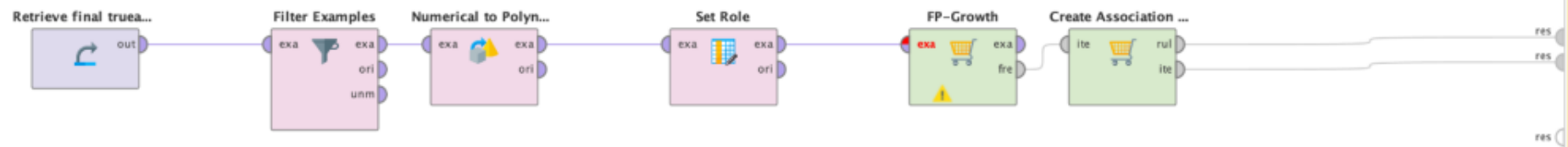


Basket  
Market  
Analysis

Various  
Models

Decision  
Tree

# Basket Market Analysis Process via Rapid Miner



# Various Models

various models  
process via rapid miner

1

2

3

4

5



- ▶ Training Resources (connected)
- ▶ Samples
- ▶ Community Samples (connected)
- ▶ DB
- ▶ FinalGP (salehabbas)
- ▶ GP (salehabbas)
- ▶ Local Repository (salehabbas)
- ▶ Temporary Repository (salehabbas)
- ▼ various models (salehabbas)
  - class (salehabbas - v1, 12/11/18 6:59 PM - 20 kb)
- ▶ Cloud Repository (@sconnected)

### Information

Name: class  
Number of rows: 1,546  
Number of columns: 6

### Attributes / Columns

id, age, college, section, gender, CLASS

Load Data   **Select Task**   Prepare Target   Select Inputs   Model Types   Results

« RESTART   < BACK   **> NEXT**

### Predict

Want to predict the values of a column?

### Clusters

Want to identify groups in your data?

### Outliers

Want to detect outliers in your data?

id Number	age Number	college Category	section Category	gender Category	CLASS Category
11243918	24	Art	earthenware	male	EHL
11420370	22	Art	earthenware	male	ACGL
11421044	20	Art	graphic design	female	BCEK
11422630	22	Art	graphic design	female	ACEH
11523685	21	Art	earthenware	male	ADF
11523695	21	Art	graphic design	female	AHL
11524367	20	Art	earthenware	female	CHI
11524366	21	Art	graphic design	female	BDG
11524836	21	Art	earthenware	female	BDK
11524886	20	Art	graphic design	male	ADGK
11525670	21	Art	earthenware	female	AFH
11525722	21	Art	earthenware	male	DFK
11526762	20	Art	graphic design	male	AFH
11526939	21	Art	graphic design	female	DGI
11527071	20	Art	earthenware	female	BDK
11527507	21	Art	earthenware	female	FGL
11527624	20	Art	earthenware	female	EHL
11527819	20	Art	graphic design	female	ACEL

Load Data Select Task Prepare Target Select Inputs Model Types Results

RESTART BACK NEXT

### Predict

Want to predict the values of a column?

### Clusters

Want to identify groups in your data?

### Outliers

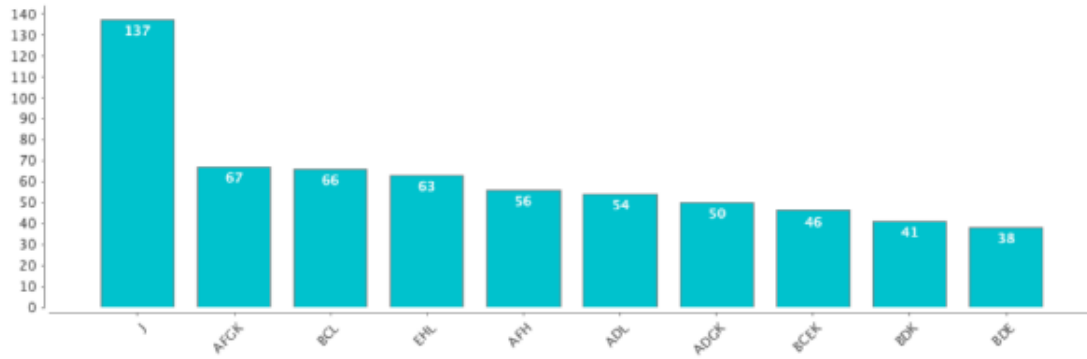
Want to detect outliers in your data?

id Number	age Number	college Category	section Category	gender Category	CLASS Category
11243918	24	Art	earthenware	male	EHL
11420370	22	Art	earthenware	male	ACGL
11421044	20	Art	graphic design	female	BCEK
11422630	22	Art	graphic design	female	ACEH
11523685	21	Art	earthenware	male	ADF
11523695	21	Art	graphic design	female	AHL
11524367	20	Art	earthenware	female	CHI
11524366	21	Art	graphic design	female	BDG
11524836	21	Art	earthenware	female	BDK
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11525722	21	Art	earthenware	male	DFK
11526762	20	Art	graphic design	male	AFH
11526939	21	Art	graphic design	female	DGI
11527071	20	Art	earthenware	female	BDK
11527507	21	Art	earthenware	female	FGL
11527624	20	Art	earthenware	female	EHL
11527819	20	Art	graphic design	female	ACEL
11541975	21	Art	earthenware	female	BEGK
11541994	21	Art	graphic design	male	BDK
11542199	21	Art	graphic design	male	BCEG
11542250	20	Art	earthenware	male	ADGK
11542277	21	Art	earthenware	female	AFGK
11610332	20	Art	graphic design	male	AFGK
.....	--	-	-	-	.....

1,546 rows - 6 columns (4 nominal, 2 numerical)

Load Data    Select Task    **Prepare Target**    Select Inputs    Model Types    Results

⏪ RESTART    ⏪ BACK    **> NEXT**



Class of Highest Interest:

Map Classes to New Values

ACEGK:

ACEH:

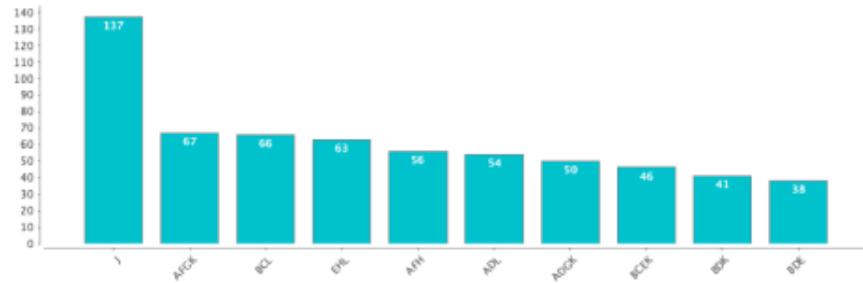
ACEI:

ACEIL:

ACEL:

ACFK:

ACEK:



Class of Highest Interest:

Map Classes to New Values

ACEGK:

ACEH:

ACEI:

ACEJ:

ACEK:

ACFK:

ACGI:

ACGL:

ACGL:

ACHK:

ADEG:

ADEK:

Load Data   Select Task   Prepare Target   **Select Inputs**   Model Types   Results



⏪ RESTART   ⏪ BACK   **> NEXT**

Selected: 4 / Total: 5

Select All    Deselect All

Selected	Status ↑	Quality	Name	Correlation	ID-ness	Stability	Missing
<input type="checkbox"/>	●		id	15.44%	96.83%	0.13%	0.00%
<input checked="" type="checkbox"/>	●		age	0.75%	0.52%	40.17%	0.00%
<input checked="" type="checkbox"/>	●		college	0.84%	0.39%	40.43%	0.00%
<input checked="" type="checkbox"/>	●		section	0.79%	1.62%	19.73%	0.00%
<input checked="" type="checkbox"/>	●		gender	0.42%	0.13%	60.80%	0.00%



Selected: 4 / Total: 5

Select All    Deselect All

Selected	Status ↑	Quality	Name	Correlation	ID-ness	Stability	Missing
<input type="checkbox"/>	●		id	15.44%	96.83%	0.13%	0.00%
<input checked="" type="checkbox"/>	●		age	0.75%	0.52%	40.17%	0.00%
<input checked="" type="checkbox"/>	●		college	0.84%	0.39%	40.43%	0.00%
<input checked="" type="checkbox"/>	●		section	0.79%	1.62%	19.73%	0.00%
<input checked="" type="checkbox"/>	●		gender	0.42%	0.13%	60.80%	0.00%



## General

- Correlations between Columns
- Importance of Columns

## Models

- Naive Bayes
- Generalized Linear Model (GLM)
  - Use Regularization    Calculate p-Values
- Deep Learning
- Decision Tree
  - Automatically Optimize   Maximal Depth:
- Random Forest
  - Automatically Optimize   Number of Trees:    Maximal Depth:
- Gradient Boosted Trees (XGBoost)
  - Automatically Optimize   Number of Trees:    Maximal Depth:



### General

Correlations between Columns

Importance of Columns

### Models

Naive Bayes

Generalized Linear Model (GLM)

Use Regularization    Calculate p-Values

Deep Learning

Decision Tree

Automatically Optimize   Maximal Depth:

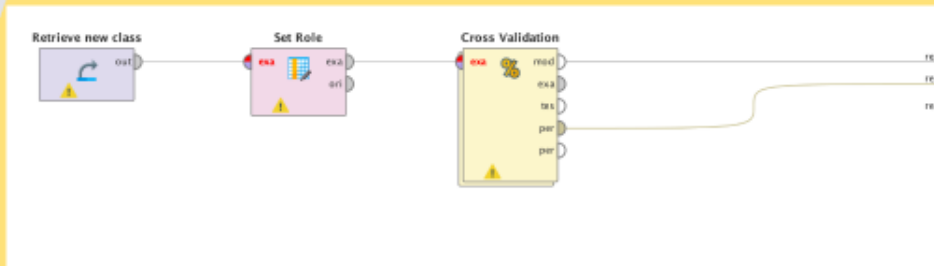
Random Forest

Automatically Optimize   Number of Trees:    Maximal Depth:

Gradient Boosted Trees (XGBoost)

Automatically Optimize   Number of Trees:    Maximal Depth:

# Decision Tree



# DECISION TREE

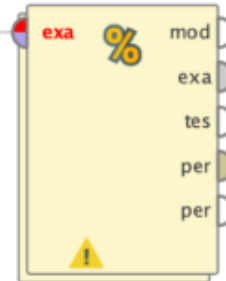
Retrieve new class



Set Role



Cross Validation



res  
res  
res

Training

tra

Decision Tree



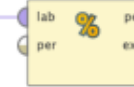
Testing

mod  
thr  
thr  
thr

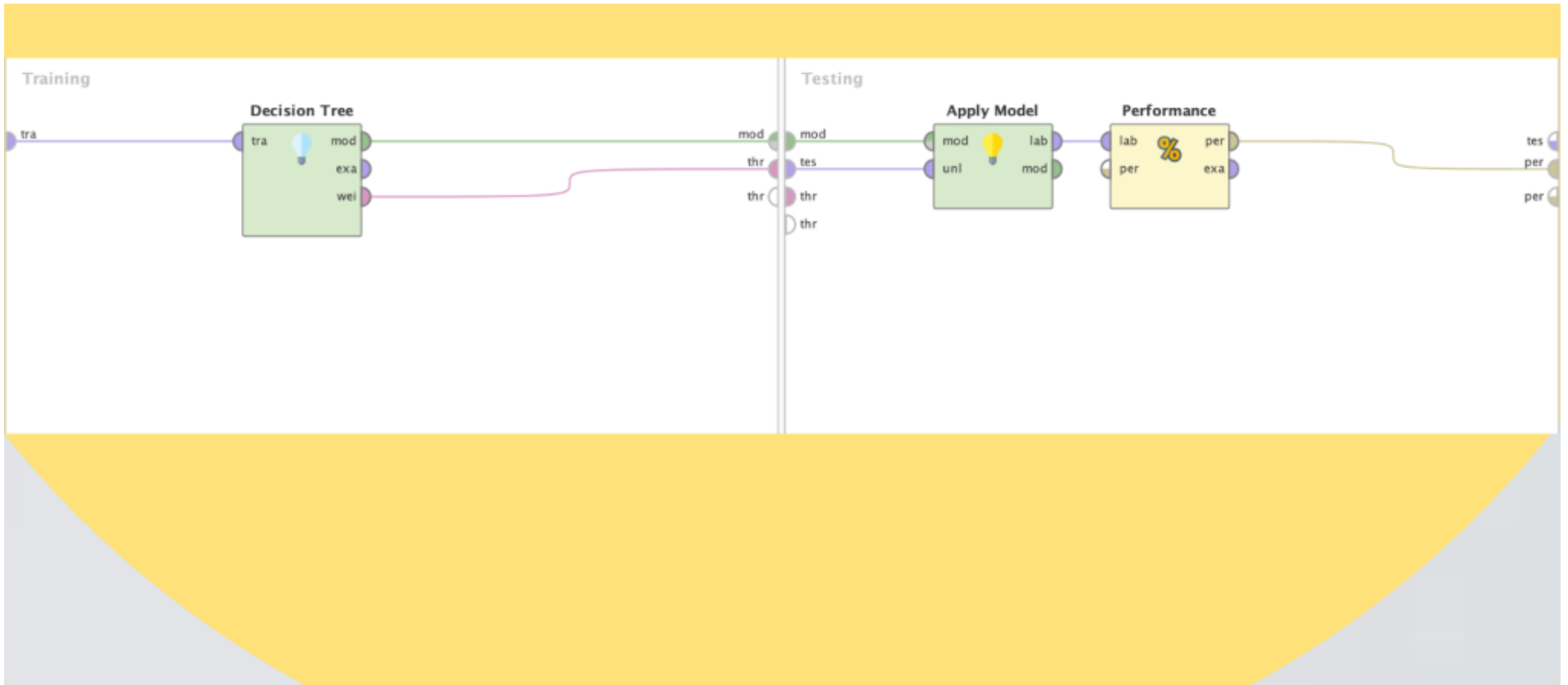
Apply Model



Performance



tes  
per  
per



# "DCS" Graduation Project Presentation



Recommendation

CRISP DM

Problems

Introduction

Evaluation

Deployment



# Evaluation

- Model validation .
- Review Results .

BMA

Various  
Models

various models  
new class

Forecasting

Charts

# Market Basket Analysis Results

Item	Support	Item 1	Item 2	Item 3	Item 4	Item 5
3	0.014	working10	blood unit10	drug10		
3	0.029	working10	blood unit10	prn10		
3	0.061	working10	blood unit10	drug10		
3	0.099	working10	blood unit10	prn10		
3	0.061	working10	drug10	drug10		
3	0.088	blood unit10	drug10	working10		
3	0.087	blood unit10	drug10	drug10		
3	0.089	blood unit10	working10	drug10		
3	0.088	blood unit10	working10	prn10		
4	0.021	medbook10	drug10	drug10		working10
4	0.013	medbook10	drug10	drug10		blood unit10
4	0.019	medbook10	drug10	drug10		working10
4	0.021	medbook10	drug10	working10		blood unit10
4	0.088	medbook10	drug10	working10		blood unit10
4	0.087	medbook10	drug10	working10		drug10
4	0.033	medbook10	drug10	blood unit10		working10
4	0.041	medbook10	drug10	blood unit10		drug10
4	0.021	medbook10	drug10	working10		blood unit10
4	0.015	medbook10	drug10	working10		blood unit10
4	0.021	medbook10	drug10	working10		drug10
4	0.087	medbook10	drug10	working10		prn10
4	0.087	medbook10	drug10	blood unit10		drug10
4	0.011	medbook10	drug10	blood unit10		working10
4	0.014	medbook10	working10	blood unit10		drug10
4	0.081	medbook10	working10	blood unit10		prn10
4	0.033	medbook10	drug10	drug10		working10
4	0.024	medbook10	drug10	drug10		blood unit10
4	0.011	medbook10	drug10	working10		blood unit10
4	0.021	drug10	drug10	working10		blood unit10
4	0.089	drug10	drug10	working10		blood unit10
4	0.017	drug10	working10	blood unit10		prn10
5	0.021	medbook10	drug10	drug10	working10	blood unit10

Association Rule

Association Rule

Size	Support	Item 1	Item 2	Item 3	Item 4	Item 5
3	0.014	teaching10	Blood unit10	draw20		
3	0.023	teaching10	Blood unit10	print20		
3	0.005	teaching10	Blood unit20	draw20		
3	0.009	teaching10	Blood unit20	print20		
3	0.011	teaching10	draw20	field20		
3	0.008	Blood unit10	draw20	teaching20		
3	0.007	Blood unit10	draw20	field20		
3	0.009	Blood unit10	teaching20	field20		
3	0.008	Blood unit10	teaching20	print20		
4	0.021	notebook10	draw10	field10	teaching10	
4	0.021	notebook10	draw10	field10	Blood unit10	
4	0.013	notebook10	draw10	field10	teaching20	
4	0.021	notebook10	draw10	teaching10	Blood unit10	
4	0.008	notebook10	draw10	teaching10	Blood unit20	
4	0.007	notebook10	draw10	teaching10	field20	
4	0.033	notebook10	draw10	Blood unit10	teaching20	
4	0.045	notebook10	draw10	Blood unit10	field20	
4	0.021	notebook10	field10	teaching10	Blood unit10	
4	0.015	notebook10	field10	teaching10	Blood unit20	
4	0.025	notebook10	field10	teaching10	draw20	
4	0.007	notebook10	field10	teaching10	print20	
4	0.007	notebook10	field10	Blood unit10	draw20	
4	0.011	notebook10	field10	Blood unit10	teaching20	
4	0.014	notebook10	teaching10	Blood unit10	draw20	
4	0.005	notebook10	teaching10	Blood unit10	print20	
4	0.033	notebook20	draw10	field10	teaching10	
4	0.024	notebook20	draw10	field10	Blood unit10	
4	0.011	notebook20	draw10	teaching10	Blood unit10	
4	0.021	draw10	field10	teaching10	Blood unit10	
4	0.009	draw10	field10	teaching10	Blood unit20	
4	0.017	field10	teaching10	Blood unit10	print20	
5	0.021	notebook10	draw10	field10	teaching10	Blood unit10

No.	Premises	Conclusion	Support	Confidence	LiftRate	Gain	p-s	Lift	Conv...
57	notebook10, Blood unit10	draw10	0.189	0.732	0.958	-0.174	0.058	2.277	2.510
58	notebook10, draw10	Blood unit10	0.189	0.738	0.971	-0.187	0.083	2.481	2.872
59	notebook20, draw10, teaching10	feM10	0.033	0.754	0.990	-0.054	0.019	2.411	2.792
60	notebook10, Blood unit10, teaching10	draw10	0.033	0.738	0.990	-0.053	0.019	2.358	2.800
61	draw10, teaching20	notebook10	0.038	0.763	0.989	-0.059	0.018	1.990	2.581
62	teaching10, Blood unit10, print0	feM10	0.017	0.785	0.991	-0.028	0.009	2.480	2.921
63	notebook20, draw10	teaching10	0.044	0.767	0.987	-0.071	0.027	2.629	3.043
64	Blood unit20, feM10	notebook10	0.038	0.783	0.990	-0.059	0.019	2.044	2.819
65	notebook10, feM10, draw10	teaching10	0.025	0.787	0.994	-0.058	0.018	2.697	3.128
66	notebook20, teaching10, Blood unit10	draw10	0.011	0.842	0.998	-0.015	0.007	2.021	4.298
67	notebook10, draw10, feM10	Blood unit10	0.043	0.872	0.994	-0.059	0.031	3.093	3.801
68	feM10, Blood unit10, teaching10	notebook10	0.011	0.888	0.999	-0.013	0.006	2.326	3.161
69	notebook20, feM10, teaching10	draw10	0.033	0.907	0.997	-0.039	0.021	2.824	7.330
70	draw10, feM10, teaching20	notebook10	0.013	0.908	0.999	-0.016	0.008	2.379	6.797
71	notebook20, feM10, Blood unit10	draw10	0.024	0.913	0.998	-0.028	0.016	2.873	8.813
72	draw10, Blood unit10, feM10	notebook10	0.043	0.932	0.997	-0.052	0.027	2.438	9.021
73	draw10, Blood unit10, teaching10	notebook10	0.033	0.962	0.999	-0.036	0.020	2.516	16.089
74	feM10, Blood unit10, print0	teaching10	0.017	0.963	0.999	-0.019	0.012	3.299	10.118
75	notebook10, draw10, Blood unit20	teaching10	0.008	1	1	-0.008	0.006	3.426	=
76	notebook10, teaching10, feM10	draw10	0.007	1	1	-0.007	0.005	3.112	=
77	notebook10, Blood unit10, feM10	draw10	0.043	1	1	-0.043	0.031	3.112	=
78	notebook10, feM10, Blood unit10	teaching10	0.015	1	1	-0.015	0.010	3.426	=
79	feM10, teaching10, draw10	notebook10	0.025	1	1	-0.025	0.015	2.617	=
80	feM10, Blood unit10, draw10	notebook10	0.007	1	1	-0.007	0.004	2.617	=
81	teaching10, Blood unit10, draw10	notebook10	0.014	1	1	-0.014	0.009	2.617	=
82	notebook10, Blood unit10, print0	teaching10	0.005	1	1	-0.005	0.004	3.426	=
83	draw10, feM10, Blood unit20	teaching10	0.009	1	1	-0.009	0.006	3.426	=
84	notebook10, draw10, feM10, teaching10	Blood unit10	0.021	1	1	-0.021	0.015	3.547	=
85	notebook10, draw10, feM10, Blood unit10	teaching10	0.021	1	1	-0.021	0.015	3.426	=
86	notebook10, draw10, teaching10, Blood unit10	feM10	0.021	1	1	-0.021	0.015	3.399	=
87	notebook10, feM10, teaching10, Blood unit10	draw10	0.021	1	1	-0.021	0.015	3.112	=
88	draw10, feM10, teaching10, Blood unit10	notebook10	0.021	1	1	-0.021	0.013	2.617	=

No.	Premises	Conclusion	Support	Confidence	LaPlace	Gain	p-s	Lift	Convic..
57	notebook10, Blood unit10	draw10	0.100	0.732	0.968	-0.174	0.056	2.277	2.530
58	notebook10, draw10	Blood unit10	0.100	0.750	0.971	-0.167	0.063	2.661	2.872
59	notebook20, draw10, teaching10	field10	0.033	0.754	0.990	-0.054	0.019	2.411	2.792
60	notebook10, Blood unit10, teaching20	draw10	0.033	0.758	0.990	-0.055	0.019	2.358	2.800
61	draw20, teaching20	notebook10	0.036	0.761	0.989	-0.059	0.018	1.990	2.581
62	teaching10, Blood unit10, print20	field10	0.017	0.765	0.995	-0.028	0.010	2.446	2.921
63	notebook20, draw20	teaching10	0.044	0.767	0.987	-0.071	0.027	2.629	3.045
64	Blood unit20, field20	notebook10	0.038	0.781	0.990	-0.059	0.019	2.044	2.819
65	notebook10, field10, draw20	teaching10	0.025	0.787	0.994	-0.038	0.016	2.697	3.328
66	notebook20, teaching10, Blood unit10	draw10	0.011	0.842	0.998	-0.015	0.007	2.621	4.298
67	notebook10, draw10, field20	Blood unit10	0.045	0.872	0.994	-0.059	0.031	3.093	5.601
68	field10, Blood unit10, teaching20	notebook10	0.011	0.889	0.999	-0.013	0.006	2.326	5.561
69	notebook20, field10, teaching10	draw10	0.033	0.907	0.997	-0.039	0.021	2.824	7.330
70	draw10, field10, teaching20	notebook10	0.013	0.909	0.999	-0.016	0.008	2.379	6.797
71	notebook20, field10, Blood unit10	draw10	0.024	0.923	0.998	-0.028	0.016	2.873	8.823
72	draw10, Blood unit10, field20	notebook10	0.045	0.932	0.997	-0.052	0.027	2.438	9.021
73	draw10, Blood unit10, teaching20	notebook10	0.033	0.962	0.999	-0.036	0.020	2.516	16.065
74	field10, Blood unit10, print20	teaching10	0.017	0.963	0.999	-0.019	0.012	3.299	19.118
75	notebook10, draw10, Blood unit20	teaching10	0.008	1	1	-0.008	0.006	3.426	∞
76	notebook10, teaching10, field20	draw10	0.007	1	1	-0.007	0.005	3.112	∞
77	notebook10, Blood unit10, field20	draw10	0.045	1	1	-0.045	0.031	3.112	∞
78	notebook10, field10, Blood unit20	teaching10	0.015	1	1	-0.015	0.010	3.426	∞
79	field10, teaching10, draw20	notebook10	0.025	1	1	-0.025	0.015	2.617	∞
80	field10, Blood unit10, draw20	notebook10	0.007	1	1	-0.007	0.004	2.617	∞
81	teaching10, Blood unit10, draw20	notebook10	0.014	1	1	-0.014	0.009	2.617	∞
82	notebook10, Blood unit10, print20	teaching10	0.005	1	1	-0.005	0.004	3.426	∞
83	draw10, field10, Blood unit20	teaching10	0.009	1	1	-0.009	0.006	3.426	∞
84	notebook10, draw10, field10, teaching10	Blood unit10	0.021	1	1	-0.021	0.015	3.547	∞
85	notebook10, draw10, field10, Blood unit10	teaching10	0.021	1	1	-0.021	0.015	3.426	∞
86	notebook10, draw10, teaching10, Blood unit10	field10	0.021	1	1	-0.021	0.015	3.199	∞
87	notebook10, field10, teaching10, Blood unit10	draw10	0.021	1	1	-0.021	0.015	3.112	∞
88	draw10, field10, teaching10, Blood unit10	notebook10	0.021	1	1	-0.021	0.013	2.617	∞

## AssociationRules

```
Association Rules
[Blood unit10, print20] ==> [teaching10] (confidence: 0.500)
[draw10, field10, Blood unit10] ==> [notebook20] (confidence: 0.507)
[draw10, teaching10, Blood unit20] ==> [field10] (confidence: 0.520)
[draw10, field10, teaching10] ==> [notebook20] (confidence: 0.521)
[teaching10, print20] ==> [Blood unit10] (confidence: 0.523)
[notebook20, field10] ==> [draw10] (confidence: 0.524)
[notebook10, teaching10, Blood unit10] ==> [draw10] (confidence: 0.525)
[notebook10, teaching10, Blood unit10] ==> [field10] (confidence: 0.525)
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[notebook10, draw10, field10] ==> [Blood unit10] (confidence: 0.533)
[notebook10, draw10, field10] ==> [teaching10, Blood unit10] (confidence: 0.533)
[draw10, field10] ==> [notebook20] (confidence: 0.534)
[field10, draw20] ==> [Blood unit20] (confidence: 0.538)
[field20] ==> [notebook10] (confidence: 0.539)
[teaching10, Blood unit10] ==> [notebook10] (confidence: 0.550)
[teaching10, Blood unit10] ==> [field10] (confidence: 0.550)
[notebook10, field10, Blood unit10] ==> [draw10] (confidence: 0.552)
[notebook10, field10, Blood unit10] ==> [teaching10] (confidence: 0.552)
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[draw20, field20] ==> [notebook10] (confidence: 0.556)
[notebook10, field10, teaching20] ==> [draw10] (confidence: 0.56)
[field10, Blood unit10] ==> [draw10] (confidence: 0.563)
[teaching10, print20] ==> [field10] (confidence: 0.569)
[notebook20, draw10, field10] ==> [teaching10] (confidence: 0.570)
[notebook10, teaching10, print20] ==> [field10] (confidence: 0.579)
[draw10, field10] ==> [teaching10] (confidence: 0.584)
[notebook10, draw10, teaching10] ==> [field10] (confidence: 0.593)
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[notebook10, draw10, teaching10] ==> [field10, Blood unit10] (confidence: 0.593)
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[draw10, teaching10, Blood unit10] ==> [field10] (confidence: 0.604)
[draw10, teaching10, Blood unit10] ==> [notebook10, field10] (confidence: 0.604)
[notebook10, field10, print20] ==> [teaching10] (confidence: 0.611)
[field10, teaching10, Blood unit20] ==> [notebook10] (confidence: 0.629)
[Blood unit10, field20] ==> [notebook10] (confidence: 0.636)
[Blood unit10, field20] ==> [notebook10, draw10] (confidence: 0.636)
[notebook10, teaching10, draw20] ==> [field10] (confidence: 0.638)
[Blood unit20, draw20] ==> [field10] (confidence: 0.643)
[notebook10, teaching10, Blood unit20] ==> [field10] (confidence: 0.647)
[notebook10, field10] ==> [teaching10] (confidence: 0.658)
[draw10, teaching10, field20] ==> [notebook10] (confidence: 0.667)
[notebook10, teaching10] ==> [field10] (confidence: 0.671)
[notebook10, Blood unit10, draw20] ==> [teaching10] (confidence: 0.677)
[Blood unit10, field20] ==> [draw10] (confidence: 0.682)
[draw10, teaching10] ==> [field10] (confidence: 0.686)
[notebook20, draw10, Blood unit10] ==> [field10] (confidence: 0.692)
[field10, teaching10, print20] ==> [Blood unit10] (confidence: 0.703)
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[notebook20, draw10, teaching10] ==> [field10] (confidence: 0.754)
```

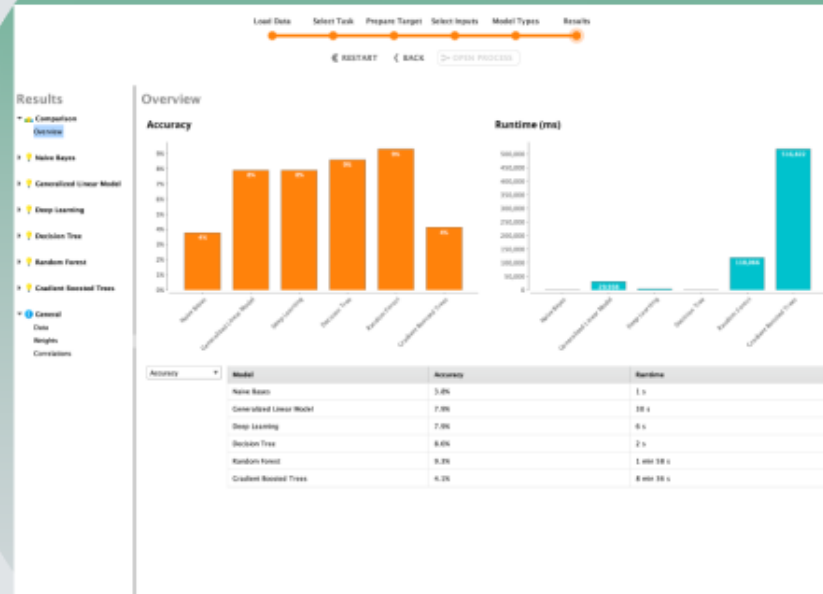
## AssociationRules

```
Association Rules
[Blood unit10, print20] ==> [teaching10] (confidence: 0.500)
[draw10, field10, Blood unit10] ==> [notebook20] (confidence: 0.507)
[draw10, teaching10, Blood unit20] ==> [field10] (confidence: 0.520)
[draw10, field10, teaching10] ==> [notebook20] (confidence: 0.521)
[teaching10, print20] ==> [Blood unit10] (confidence: 0.523)
[notebook20, field10] ==> [draw10] (confidence: 0.524)
[notebook10, teaching10, Blood unit10] ==> [draw10] (confidence: 0.525)
[notebook10, teaching10, Blood unit10] ==> [field10] (confidence: 0.525)
[field10, teaching10, Blood unit10] ==> [notebook10] (confidence: 0.525)
[field10, teaching10, Blood unit10] ==> [draw10] (confidence: 0.525)
[notebook10, teaching10, Blood unit10] ==> [draw10, field10] (confidence: 0.525)
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[draw10, field20] ==> [notebook10] (confidence: 0.527)
[field10, teaching10] ==> [notebook10] (confidence: 0.533)
[notebook10, draw10, field10] ==> [teaching10] (confidence: 0.533)
[notebook10, draw10, field10] ==> [Blood unit10] (confidence: 0.533)
[notebook10, draw10, field10] ==> [teaching10, Blood unit10] (confidence: 0.533)
[draw10, field10] ==> [notebook20] (confidence: 0.534)
[field10, draw20] ==> [Blood unit20] (confidence: 0.538)
[field20] ==> [notebook10] (confidence: 0.539)
[teaching10, Blood unit10] ==> [notebook10] (confidence: 0.550)
[teaching10, Blood unit10] ==> [field10] (confidence: 0.550)
[notebook10, field10, Blood unit10] ==> [draw10] (confidence: 0.552)
[notebook10, field10, Blood unit10] ==> [teaching10] (confidence: 0.552)
[notebook10, field10, Blood unit10] ==> [draw10, teaching10] (confidence: 0.552)
[draw20, field20] ==> [notebook10] (confidence: 0.556)
[notebook10, field10, teaching20] ==> [draw10] (confidence: 0.56)
[field10, Blood unit10] ==> [draw10] (confidence: 0.563)
[teaching10, print20] ==> [field10] (confidence: 0.569)
[notebook20, draw10, field10] ==> [teaching10] (confidence: 0.570)
[notebook10, teaching10, print20] ==> [field10] (confidence: 0.579)
[draw10, field10] ==> [teaching10] (confidence: 0.584)
[notebook10, draw10, teaching10] ==> [field10] (confidence: 0.593)
[notebook10, draw10, teaching10] ==> [Blood unit10] (confidence: 0.593)
[notebook10, draw10, teaching10] ==> [field10, Blood unit10] (confidence: 0.593)
[teaching20, print20] ==> [Blood unit10] (confidence: 0.600)
[draw10, teaching10, Blood unit10] ==> [notebook10] (confidence: 0.604)
[draw10, teaching10, Blood unit10] ==> [field10] (confidence: 0.604)
[draw10, teaching10, Blood unit10] ==> [notebook10, field10] (confidence: 0.604)
[notebook10, field10, print20] ==> [teaching10] (confidence: 0.611)
[field10, teaching10, Blood unit20] ==> [notebook10] (confidence: 0.629)
[Blood unit10, field20] ==> [notebook10] (confidence: 0.636)
[Blood unit10, field20] ==> [notebook10, draw10] (confidence: 0.636)
[notebook10, teaching10, draw20] ==> [field10] (confidence: 0.638)
[Blood unit20, draw20] ==> [field10] (confidence: 0.643)
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[draw10, teaching10, field20] ==> [notebook10] (confidence: 0.667)
[notebook10, teaching10] ==> [field10] (confidence: 0.671)
[notebook10, Blood unit10, draw20] ==> [teaching10] (confidence: 0.677)
[Blood unit10, field20] ==> [draw10] (confidence: 0.682)
[draw10, teaching10] ==> [field10] (confidence: 0.686)
[notebook20, draw10, Blood unit10] ==> [field10] (confidence: 0.692)
[field10, teaching10, print20] ==> [Blood unit10] (confidence: 0.703)
[draw10, Blood unit10] ==> [notebook10] (confidence: 0.714)
[notebook10, draw10, teaching20] ==> [Blood unit10] (confidence: 0.714)
[notebook10, Blood unit10] ==> [draw10] (confidence: 0.73)
[notebook10, draw10] ==> [Blood unit10] (confidence: 0.750)
[notebook20, draw10, teaching10] ==> [field10] (confidence: 0.754)
```

## Association Rules

```
[Blood unit10, print20] --> [teaching10] (confidence: 0.500)
[draw10, field10, Blood unit10] --> [notebook20] (confidence: 0.507)
[draw10, teaching10, Blood unit20] --> [field10] (confidence: 0.520)
[draw10, field10, teaching10] --> [notebook20] (confidence: 0.521)
[teaching10, print20] --> [Blood unit10] (confidence: 0.523)
[notebook20, field10] --> [draw10] (confidence: 0.524)
[notebook10, teaching10, Blood unit10] --> [draw10] (confidence: 0.525)
[notebook10, teaching10, Blood unit10] --> [field10] (confidence: 0.525)
[field10, teaching10, Blood unit10] --> [notebook10] (confidence: 0.525)
[field10, teaching10, Blood unit10] --> [draw10] (confidence: 0.525)
[notebook10, teaching10, Blood unit10] --> [draw10, field10] (confidenc
[field10, teaching10, Blood unit10] --> [notebook10, draw10] (confidenc
[draw10, field20] --> [notebook10] (confidence: 0.527)
[field10, teaching10] --> [notebook10] (confidence: 0.533)
[notebook10, draw10, field10] --> [teaching10] (confidence: 0.533)
[notebook10, draw10, field10] --> [Blood unit10] (confidence: 0.533)
[notebook10, draw10, field10] --> [teaching10, Blood unit10] (confidenc
[draw10, field10] --> [notebook20] (confidence: 0.534)
```

# Auto Model



Decision  
Tree

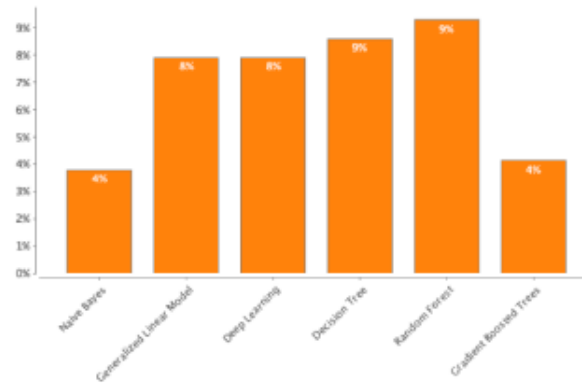
Confusion  
Matrix

## Results

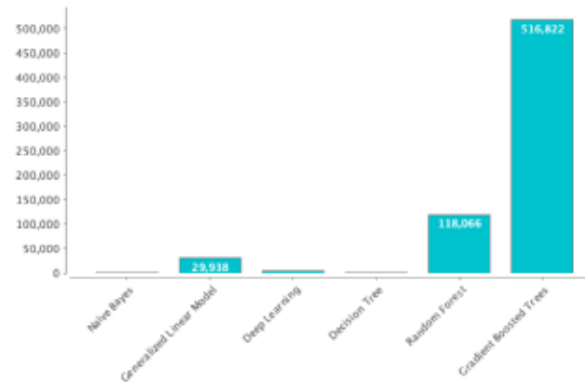
- ▼ Comparison
  - [Overview](#)
- ▶ Naive Bayes
- ▶ Generalized Linear Model
- ▶ Deep Learning
- ▶ Decision Tree
- ▶ Random Forest
- ▶ Gradient Boosted Trees
- ▼ General
  - Data
  - Weights
  - Correlations

## Overview

### Accuracy

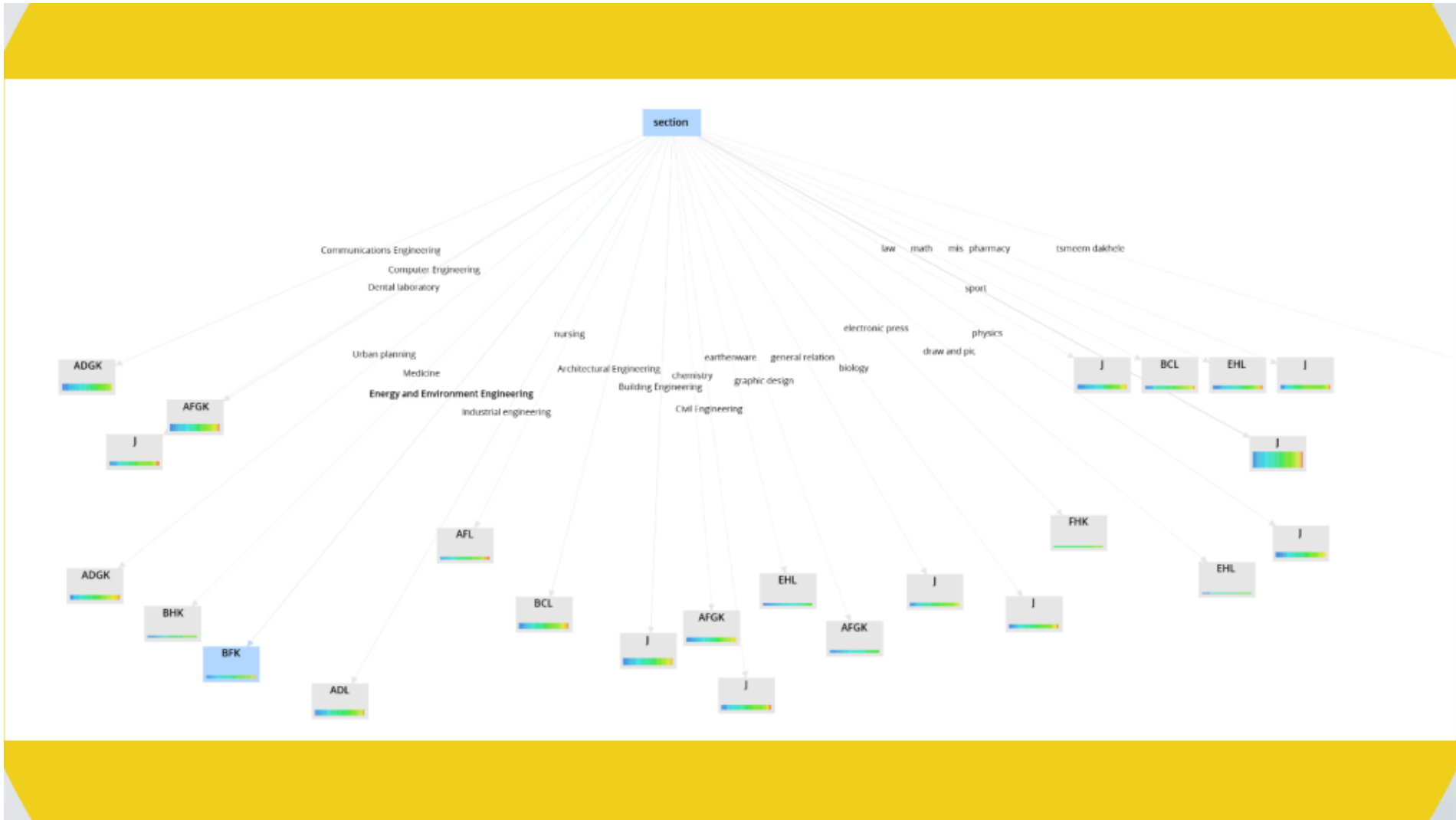


### Runtime (ms)



Accuracy	Model	Accuracy	Runtime
	Naive Bayes	3.8%	1 s
	Generalized Linear Model	7.9%	30 s
	Deep Learning	7.9%	6 s
	Decision Tree	8.6%	2 s
	Random Forest	9.3%	1 min 58 s
	Gradient Boosted Trees	4.1%	8 min 36 s





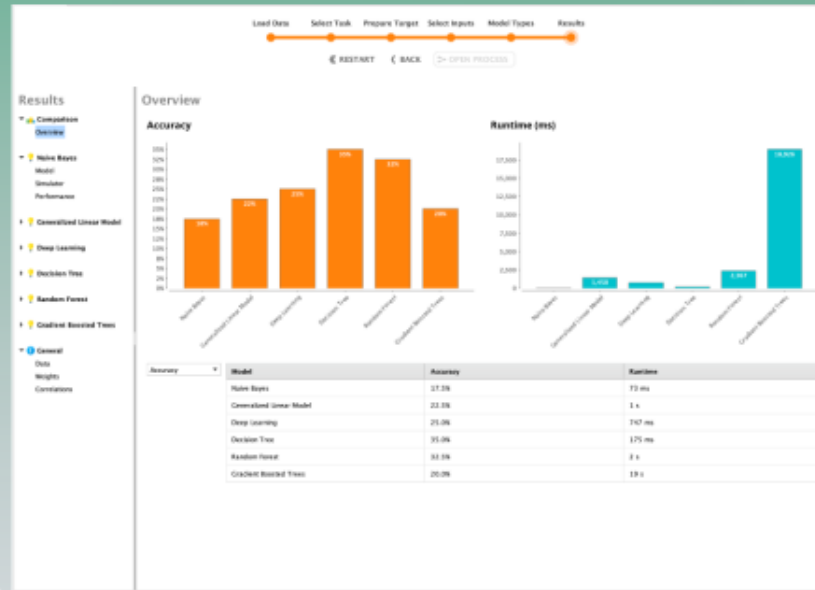
worksheet: B1596

	the DIX	the AGL	the ICEI	the ICEH	the ICEF	the IRI	the OI	the BDC	the BDK	the AD	the ARI	the DEK	the BCI	the RLI	the ACEL	the BEK	the BCC	the AFK	the CEK
prod. IRE	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1
prod. A.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
prod. E.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
prod. A.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
prod. AEF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
prod. ARI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
prod. CEI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
prod. E.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
prod. E.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
prod. A.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
prod. ARI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
prod. DRE	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
prod. DGI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
prod. FCI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
prod. A.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
prod. E.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
prod. E.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
prod. A.	1	0	1	0	0	2	1	1	2	0	1	0	1	1	1	1	1	1	0
prod. C.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
prod. A.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
prod. DLI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
prod. A.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
prod. BCI	0	0	1	0	0	0	1	0	0	2	1	0	0	0	1	1	0	0	0

accuracy: 8.59%

	true EHL	true ACGL	true BCEK	true ACEH	true ADF	true AHL	true CHI	true BDG	true BDK	true AD...	true AFH	true DFK	true DGI	true FGL	true ACEL	true BECK	true BCEG	true AFGK	true CEHK
pred. EHL	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1
pred. A...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pred. B...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pred. A...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pred. ADF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pred. AHL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pred. CHI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pred. B...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pred. B...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pred. A...	0	0	0	0	0	0	0	0	0	4	1	0	0	0	1	1	0	1	0
pred. AFH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pred. DFK	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pred. DGI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pred. FGL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pred. A...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pred. B...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pred. B...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pred. A...	1	0	1	0	0	2	1	1	1	2	0	1	0	1	1	1	0	2	0
pred. C...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pred. A...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pred. DEL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pred. A...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
pred. BCL	0	0	1	0	0	0	1	0	0	2	1	0	0	0	1	1	0	0	0

# Auto Model



Decision  
Tree

Confusion  
Matrix

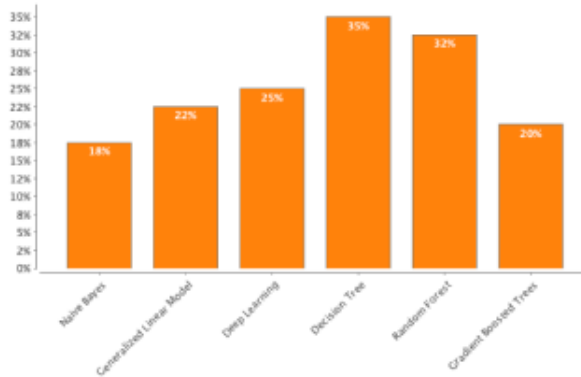


## Results

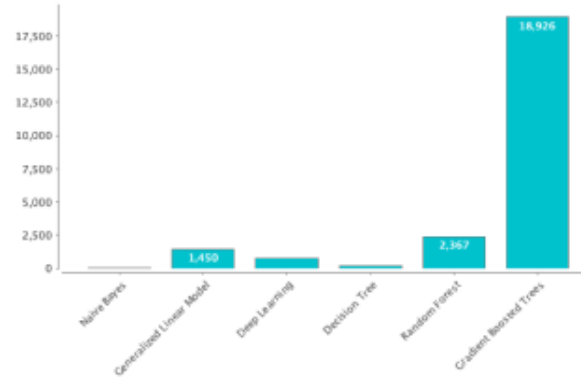
- ▾ Comparison
  - Overview
- ▾ Naive Bayes
  - Model
  - Simulator
  - Performance
- ▾ Generalized Linear Model
- ▾ Deep Learning
- ▾ Decision Tree
- ▾ Random Forest
- ▾ Gradient Boosted Trees
- ▾ General
  - Data
  - Weights
  - Correlations

## Overview

### Accuracy

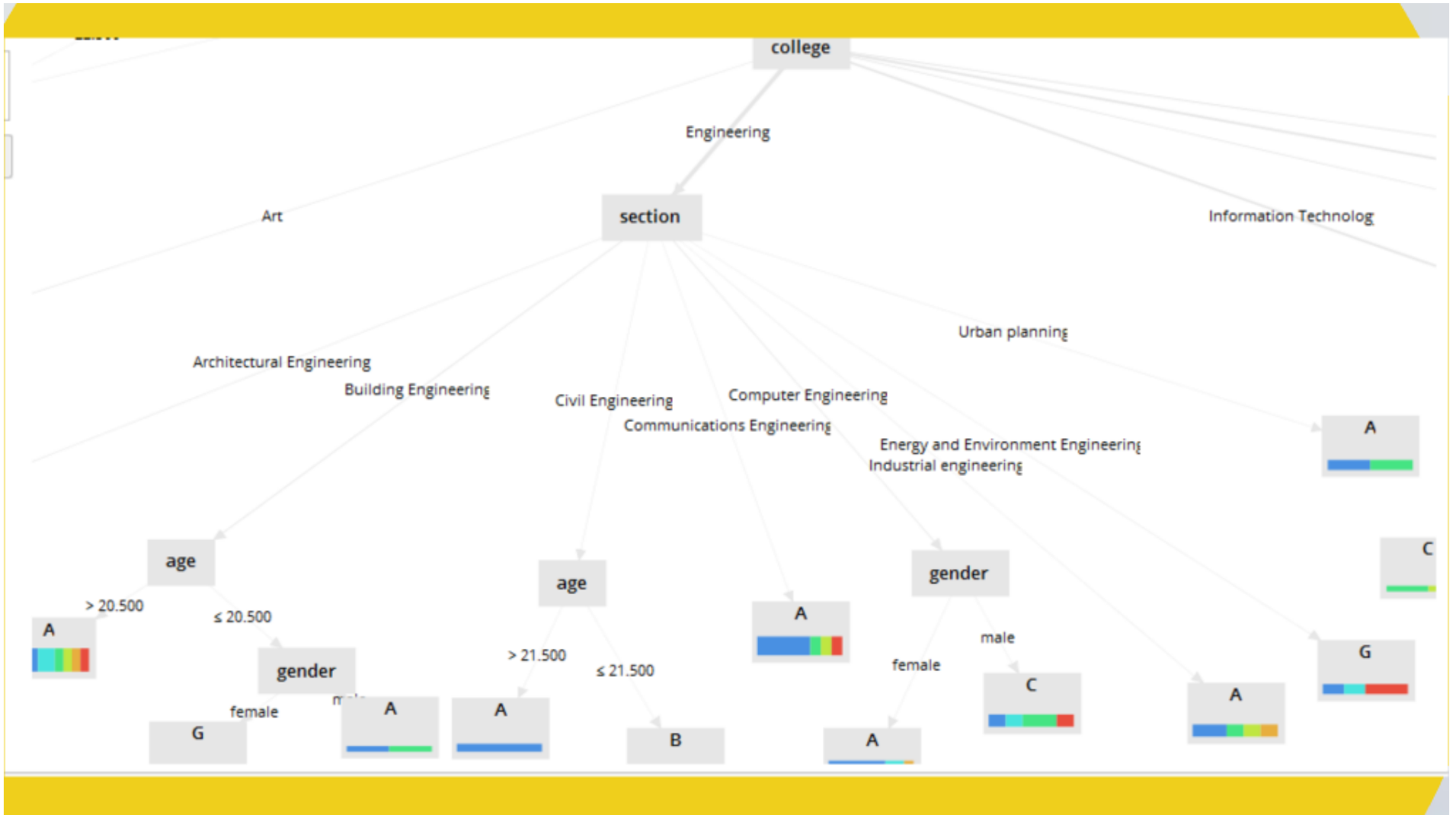


### Runtime (ms)



Accuracy ▾	Model	Accuracy	Runtime
	Naive Bayes	17.5%	73 ms
	Generalized Linear Model	22.5%	1 s
	Deep Learning	25.0%	747 ms
	Decision Tree	35.0%	175 ms
	Random Forest	32.5%	2 s
	Gradient Boosted Trees	20.0%	19 s





accuracy: 22.24% +/- 5.70% (micro average: 22.17%)

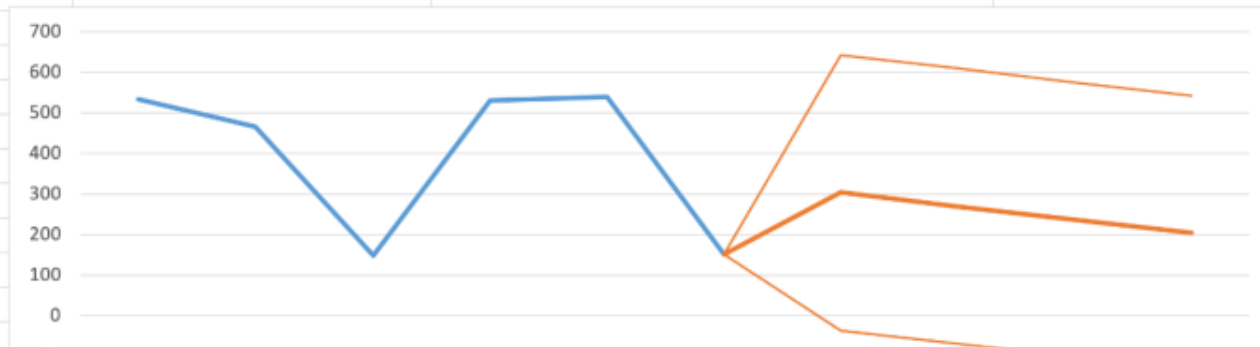
	trial A	trial B	trial C	trial D	trial E	trial F	trial G	class precision
pred. A	36	13	18	5	31	8	34	35.51%
pred. B	3	0	7	1	3	8	5	0.00%
pred. C	13	4	1	2	3	3	5	3.45%
pred. D	1	0	2	0	8	8	2	0.00%
pred. E	3	3	2	1	1	8	8	28.00%
pred. F	4	0	3	0	1	8	3	0.00%
pred. G	9	2	4	1	2	2	5	22.71%
class recall	55.88%	0.00%	2.78%	0.00%	4.78%	8.80%	25.02%	

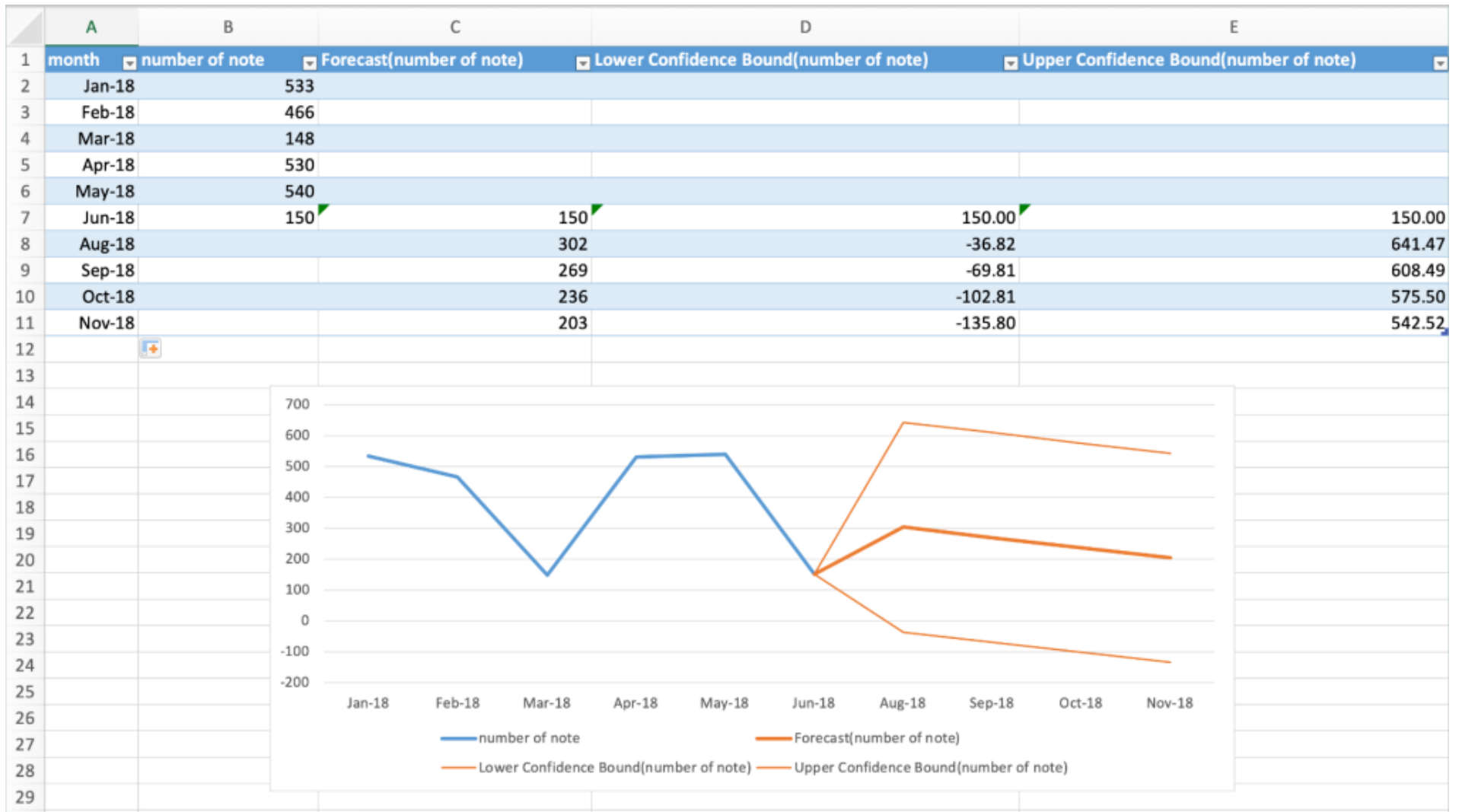
accuracy: 22.24% +/- 5.70% (micro average: 22.17%)

	true A	true B	true C	true D	true E	true F	true G	class precision
pred. A	38	13	18	5	11	8	14	35.51%
pred. B	5	0	7	1	3	0	5	0.00%
pred. C	11	4	1	2	3	3	5	3.45%
pred. D	1	0	2	0	0	0	2	0.00%
pred. E	3	3	2	1	1	0	0	10.00%
pred. F	4	0	3	0	1	0	1	0.00%
pred. G	6	2	4	1	2	2	5	22.73%
class recall	55.88%	0.00%	2.70%	0.00%	4.76%	0.00%	15.62%	

# Notes Forecasting Results

	A	B	C	D	E
1	month	number of note	Forecast(number of note)	Lower Confidence Bound(number of note)	Upper Confidence Bound(number of note)
2	Jan-18	533			
3	Feb-18	466			
4	Mar-18	148			
5	Apr-18	530			
6	May-18	540			
7	Jun-18	150	150	150.00	150.00
8	Aug-18		302	-36.82	641.47
9	Sep-18		269	-69.81	608.49
10	Oct-18		236	-102.81	575.50
11	Nov-18		203	-135.80	542.52





# Charts

different graphs of data

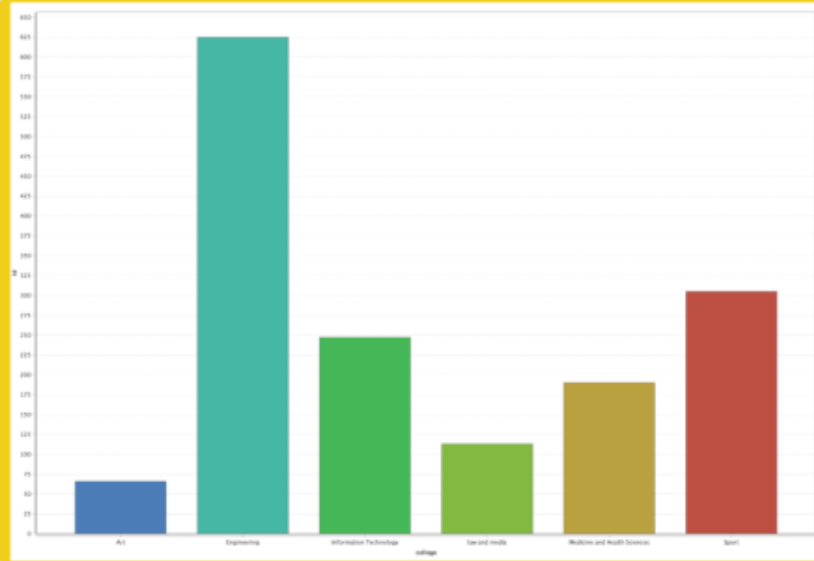


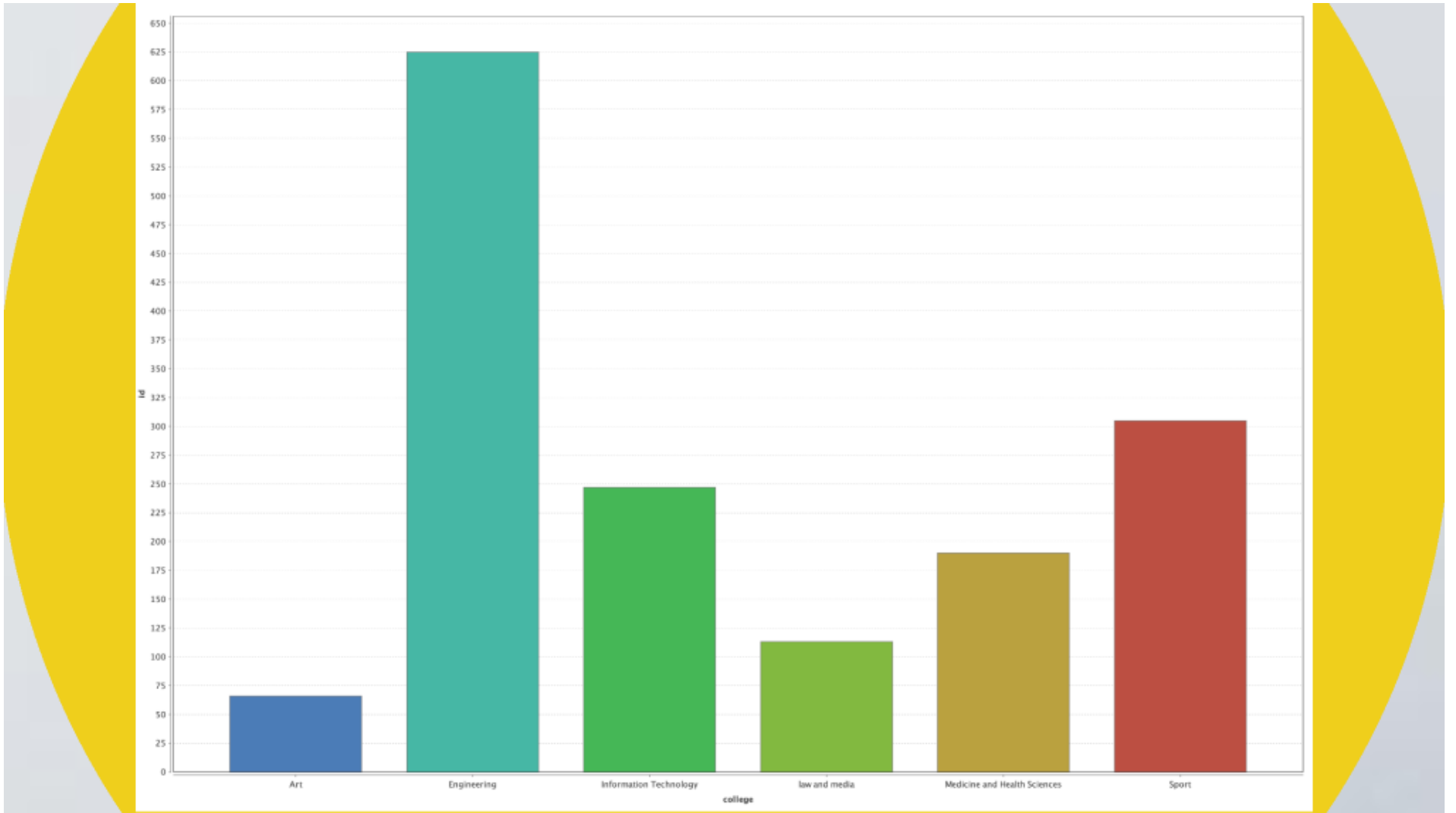
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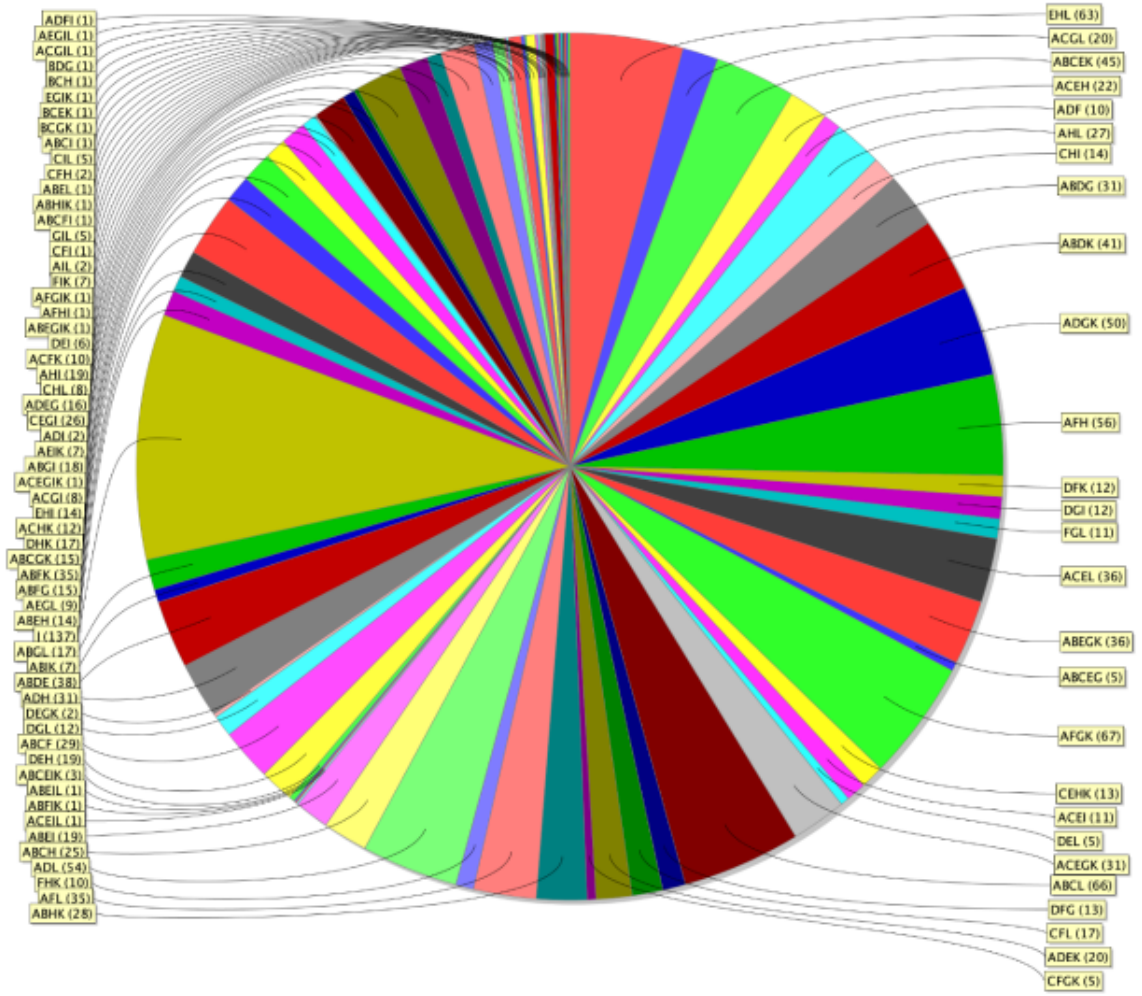
2

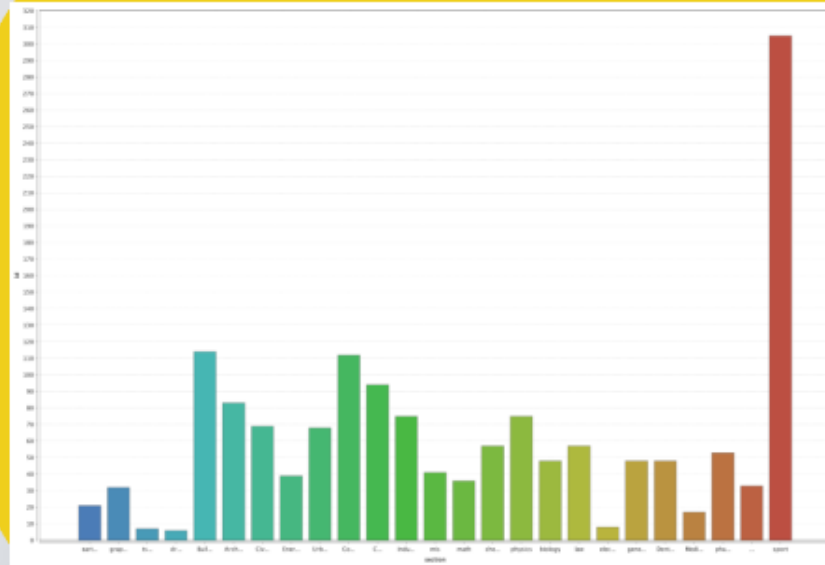
3

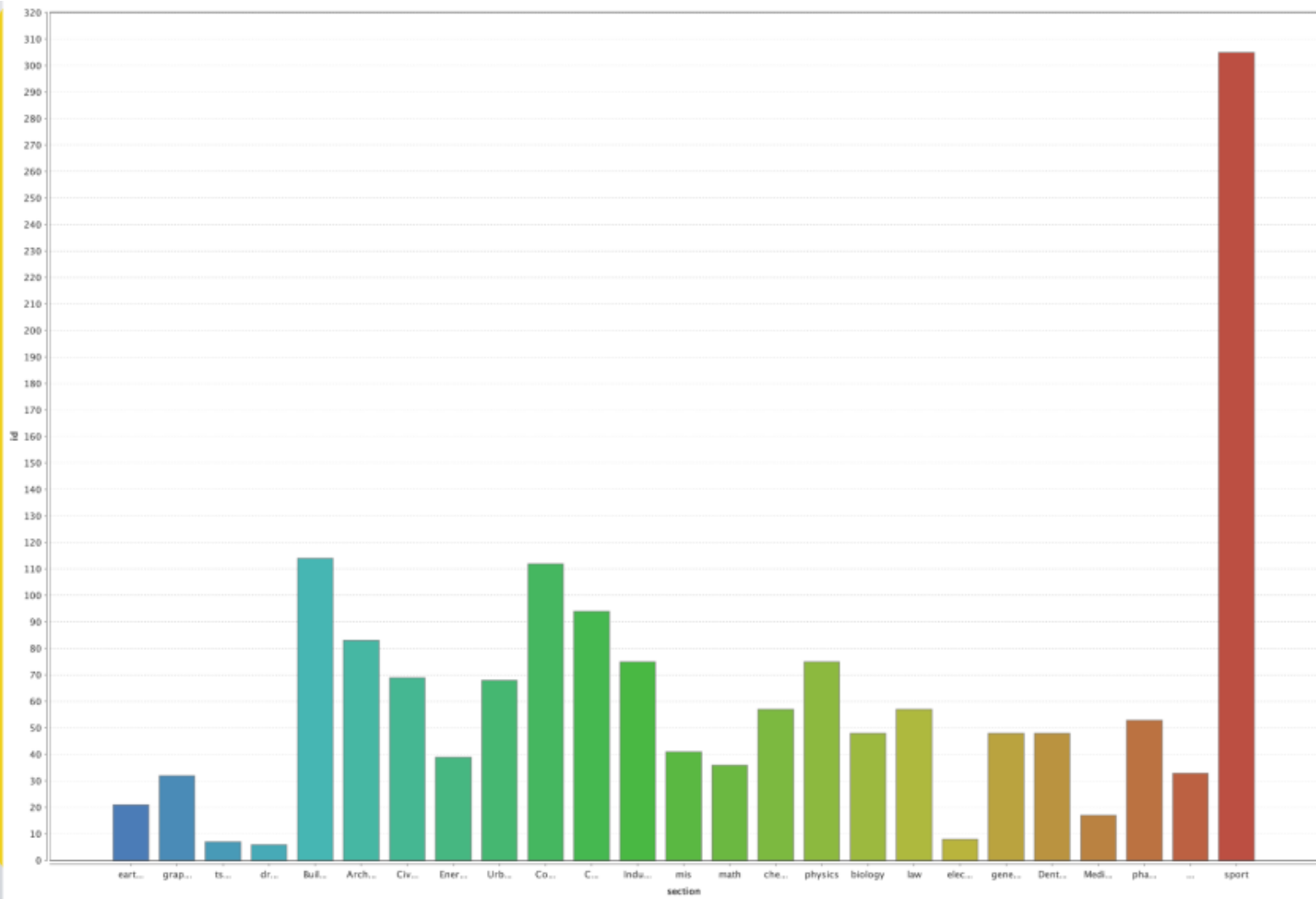
4

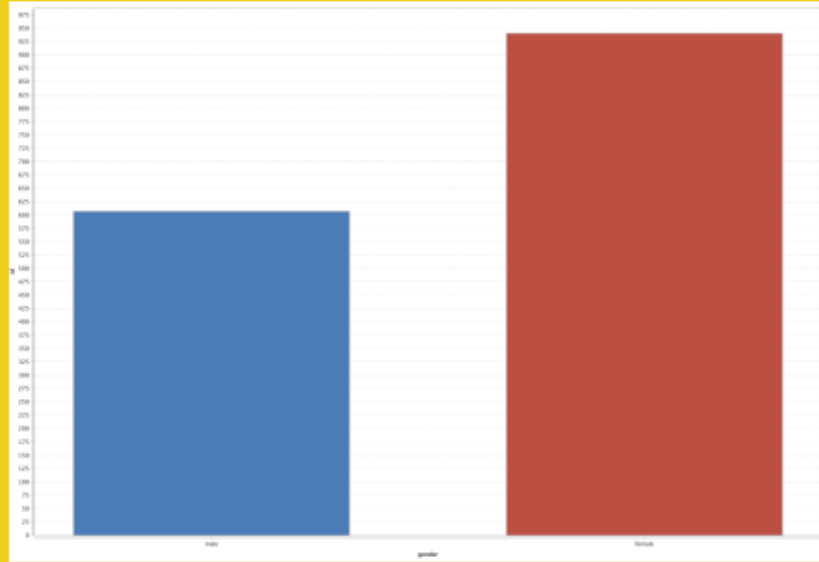


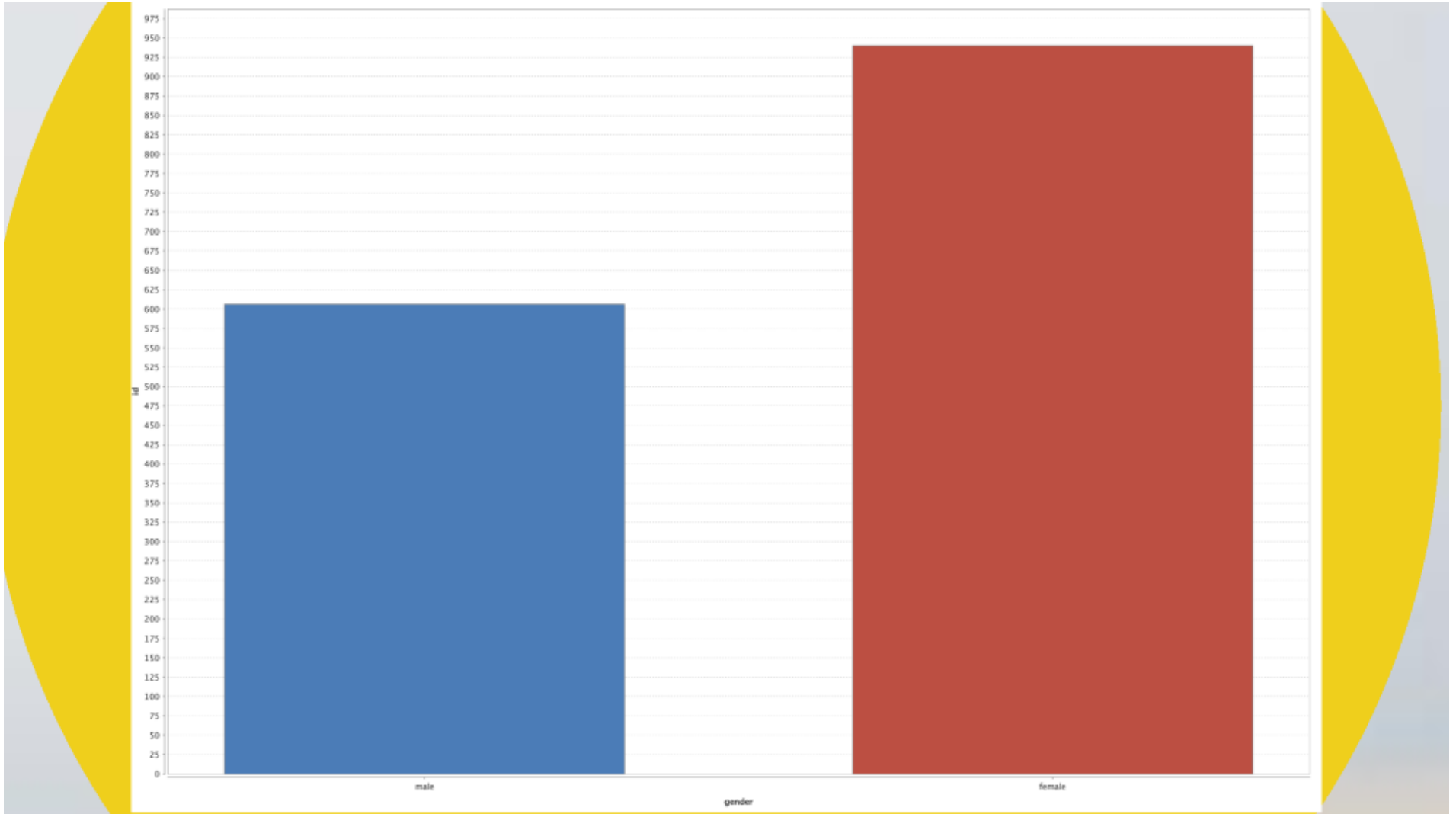












# "DCS" Graduation Project Presentation



Recommendation

CRISP DM

Problems

Introduction

Evaluation

Deployment



# Deployment

- Results Visualization
- Report Creation



Conclusion



Whereas a programmer can write a set of rules and see them being applied to a collection of text immediately, the classifier will typically need to be trained on approximately 30,000 words to perform moderately well.

**-Taming Text Book-**

# Market Basket Analysis

We deploy the market basket analysis results of all collages & for each collage alone .

# Decision Tree

## Results

Decision Tree according to classification of the classes in IF statement & according to the highest support classes

# "DCS" Graduation Project Presentation



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Problems that we faced as  
following ...



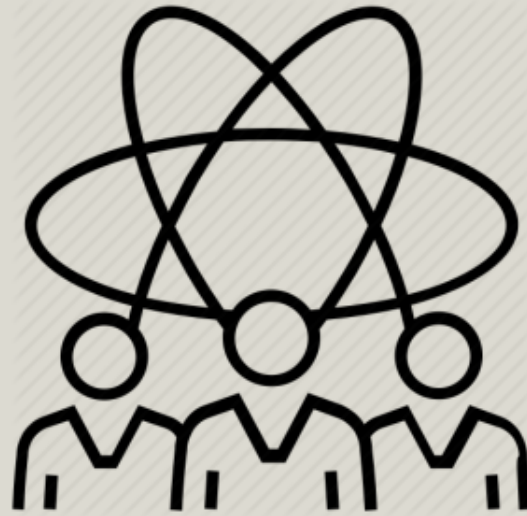
1

2

3

4

1-Difficulties in gathering the data .



2- Problem in the size of the data , it's very small so the accuracy not that good .

XS

3- we wasted time while searching about data integration tool .



4- Tool that we used , not fully support help  
in occurred errors .



# "DCS" Graduation Project Presentation



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**We would like to recommend some points as following ..**

1

2

3

4

1- Your idea must be clear .



2- We would like to recommend best practice in storing the students data to have more clear and clean data .



3- The data must be already merged , it means that all the activities for all students in one file .



4-There should be a database for the center of community service integrated with the zajel database .



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