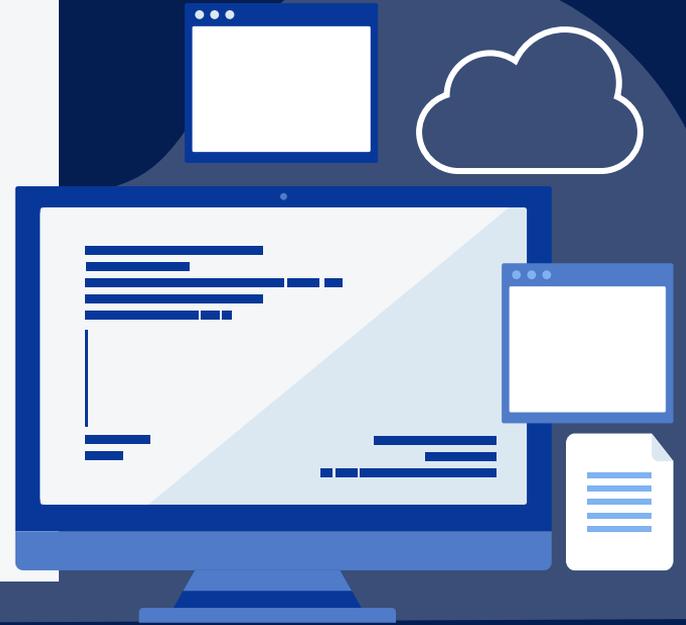




An Najah Rank

Software Graduation Project



Our Team



Supervisor
Dr. Samer Arandi



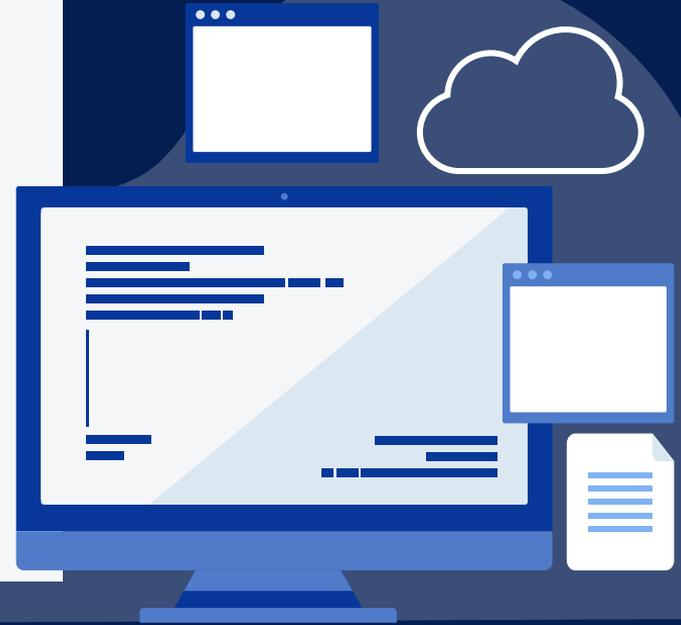
Momen Odeh



Noor Aldeen
Abu Shehadeh

Table of contents

- 01 Problem Statement
- 02 Our Solution
- 03 Features
- 04 Methodology
- 05 Challenges and Constraints
- 06 Future Work



What 's the problem?

The problem-solving skills are one of the most important skills in the workplace.

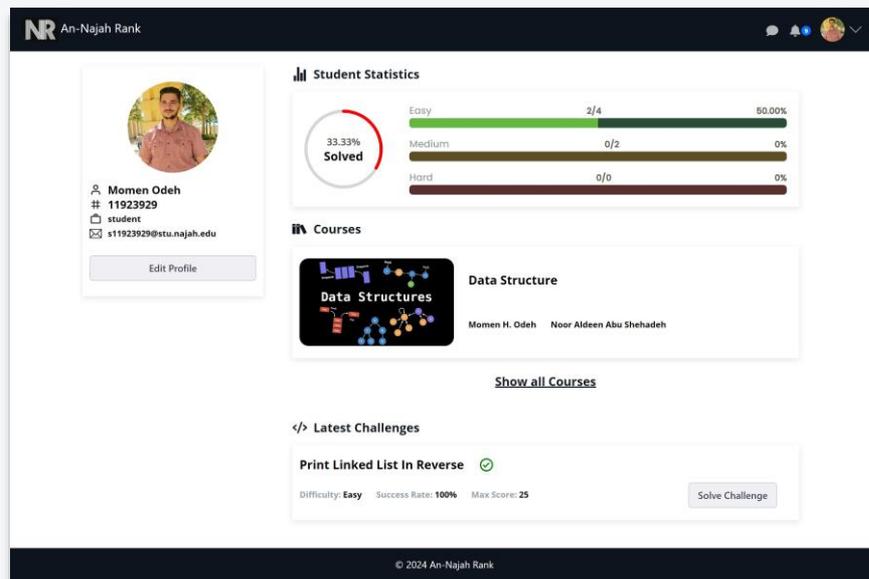
An-Najah University strives to improve these skills in our students.

Problem solving websites lack essential features that would simplify the problem-solving process and make solution grading more efficient.



Our Solution

We built An Najah Rank, a problem-solving web application that combines solving problems for students and adds the educational features needed for professors, making the process more simple.



The screenshot displays the user profile for Momen Odeh on the An-Najah Rank platform. The profile includes a circular profile picture, a name, a student ID (11923929), a role (student), and an email address (s11923929@stu.najah.edu). An 'Edit Profile' button is located below the contact information.

The 'Student Statistics' section features a circular progress indicator showing 33.33% solved. To the right, three horizontal progress bars represent performance in different difficulty levels: Easy (2/4, 50.00%), Medium (0/2, 0%), and Hard (0/0, 0%).

The 'Courses' section lists a course titled 'Data Structure' by Momen H. Odeh and Noor Aldeen Abu Shehadeh. A 'Show all Courses' link is provided below the course listing.

The 'Latest Challenges' section shows a challenge titled 'Print Linked List In Reverse' with a green checkmark icon. Below the title, the challenge details are: Difficulty: Easy, Success Rate: 100%, and Max Score: 25. A 'Solve Challenge' button is positioned to the right of these details.

The footer of the page contains the copyright notice: © 2024 An-Najah Rank.

Who use web application ?



Professors



Students



Admin

Features

01

Registration & login

02

Admin

03

Course Management

04

Manage test cases
of Challenge

05

Code operation

06

Similarity

07

Track submissions

08

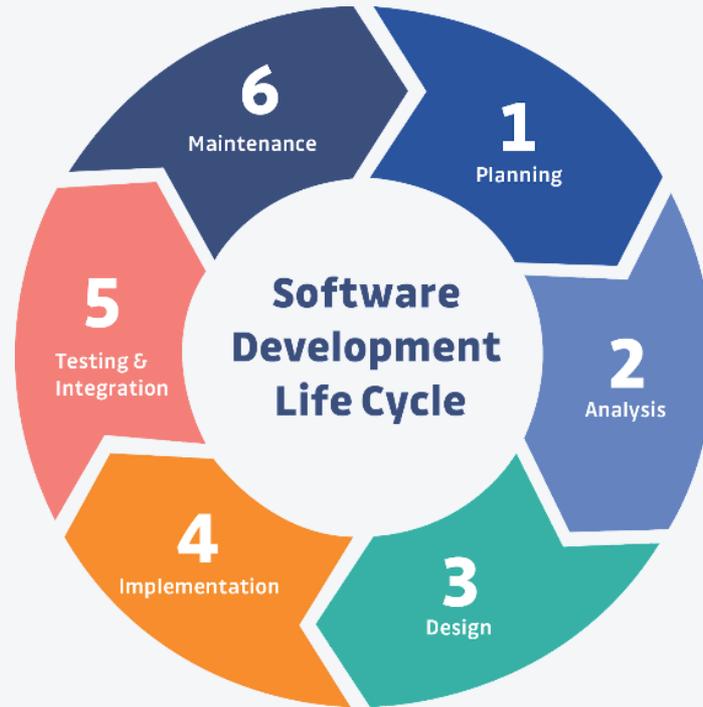
Manual Mark

09

Chatting & Notification

Methodology

Software Development Life Cycle:



Methodology (cont.)

Agile Methodology:



Planning Phase

- ❑ We met with our supervisor Dr. Samer Arandi.
- ❑ We explored various problem-solving websites.
- ❑ We are discussing new functionalities to add to the project.



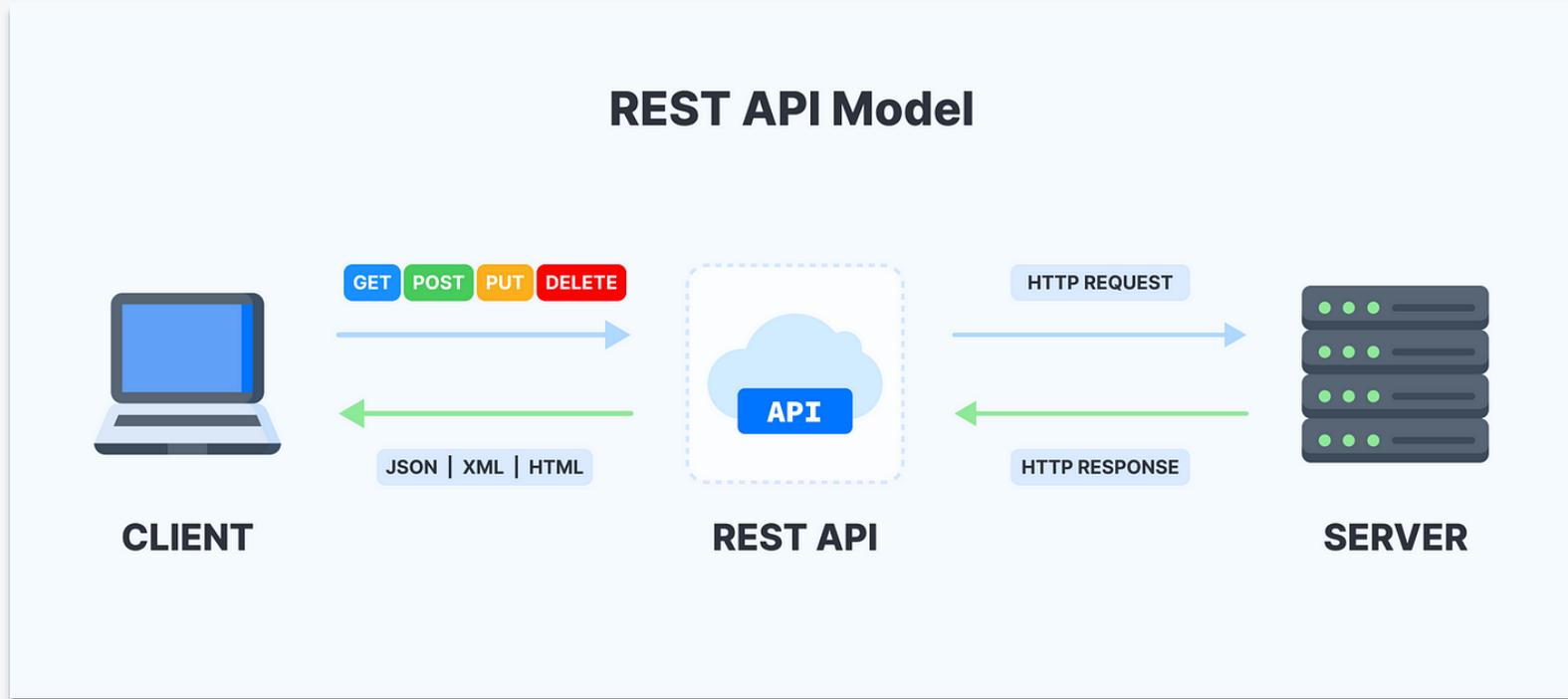
Analysis Phase

- ❑ Gathering and documenting requirements.
- ❑ Writing user stories to clearly outline specific functionalities.
- ❑ Envisioning the system's architecture using Unified Modeling Language (UML) diagrams.



Design Phase

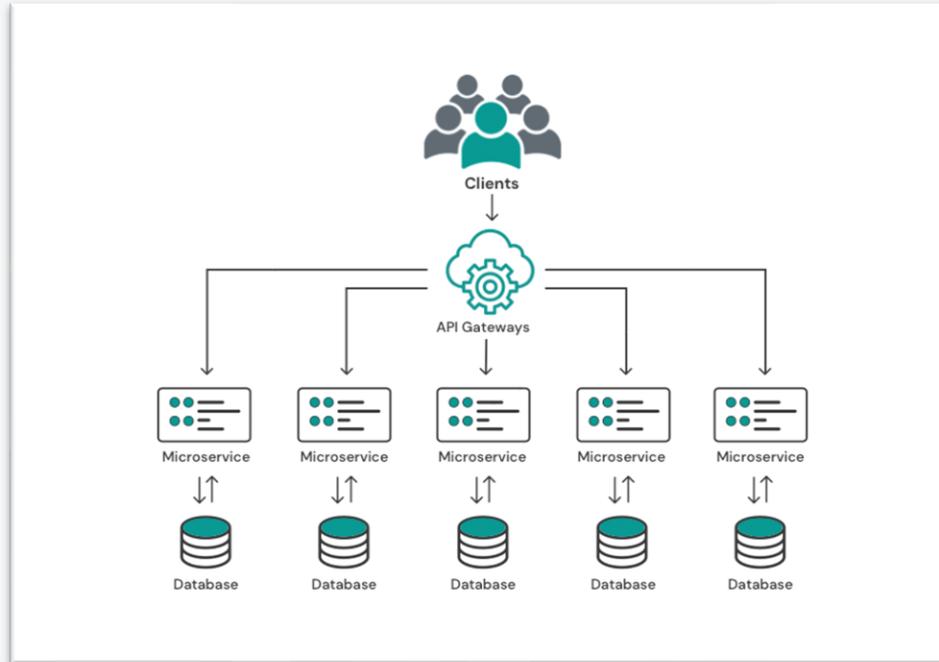
Architectural Style:



Design Phase (cont.)

Architectural Pattern:

Microservice Architectural pattern



Design Phase (cont.)

Frontend libraries:



Backend technologies :



Design Phase (cont.)

DevOps tools:

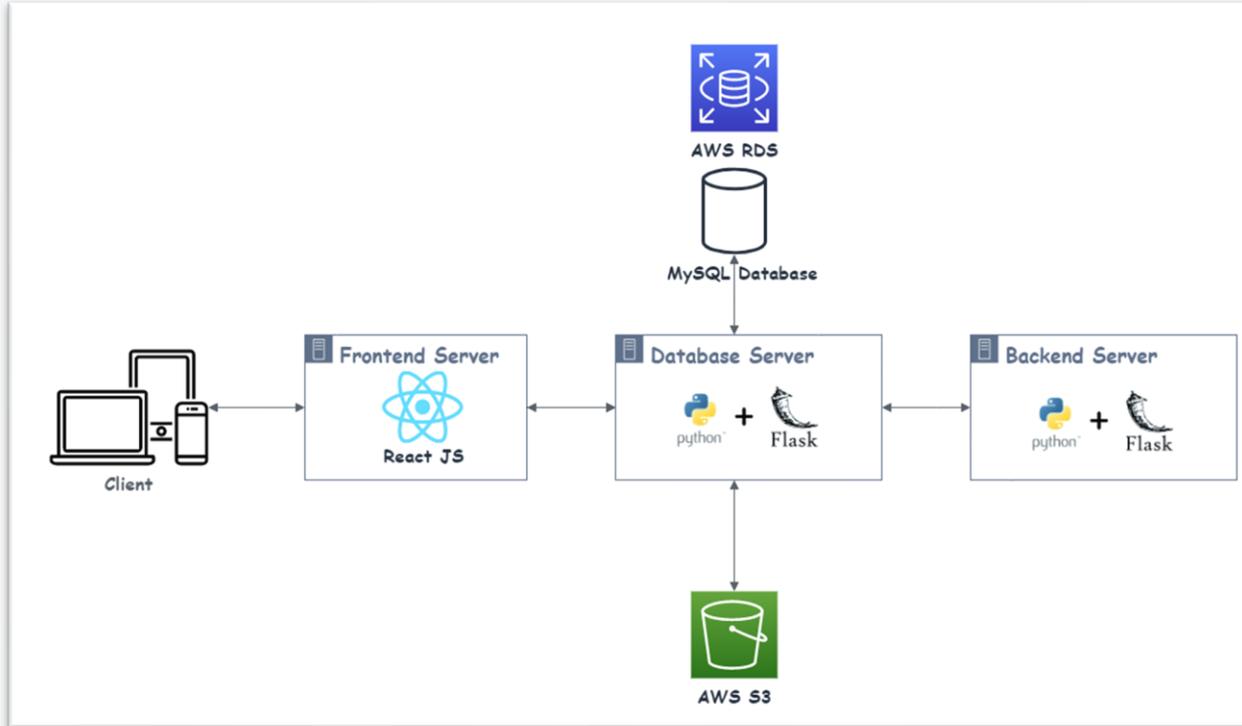


AWS Cloud Formation:



Design Phase (cont.)

Project Structure:



Security

- a) **Authentication:** verifying a user or device before allowing access to web application.
- b) **Authorization:** giving the user permission to access a specific page.
- c) **CORS policies:** a mechanism that allows restricted resources on a web page to be accessed from another domain outside the domain from which the first resource



Library used:



User Features

Registration:

NR An-Najah Rank

Sign Up

If you already have an account register
You can [Login here](#) !

Email
 Enter your email address

Full Name
 Enter your Full Name

University Number
 # Enter your University Number

Password
 Enter your Password

Confirm Password
 Confirm your Password

Sign up as professor

[Register](#)



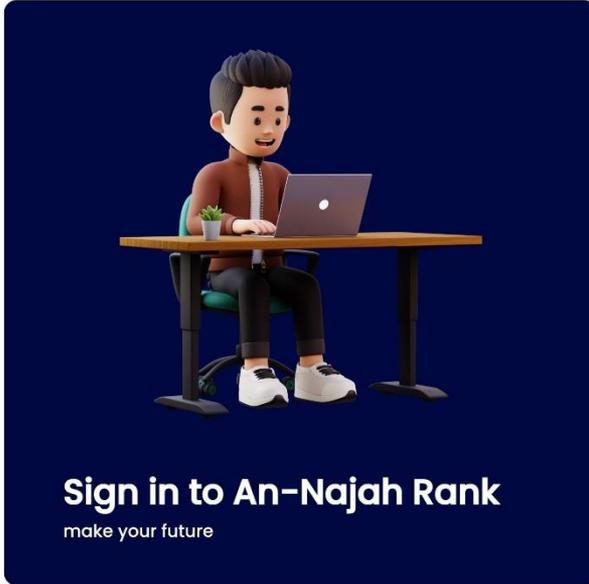
Sign Up to An-Najah Rank
make your future

© 2024 An-Najah Rank

User Features

Sign in:

NR An-Najah Rank



Sign in

If you don't have an account register
You can Register here !

Email

✉ Enter your email address

Password

🔒 Enter your Password

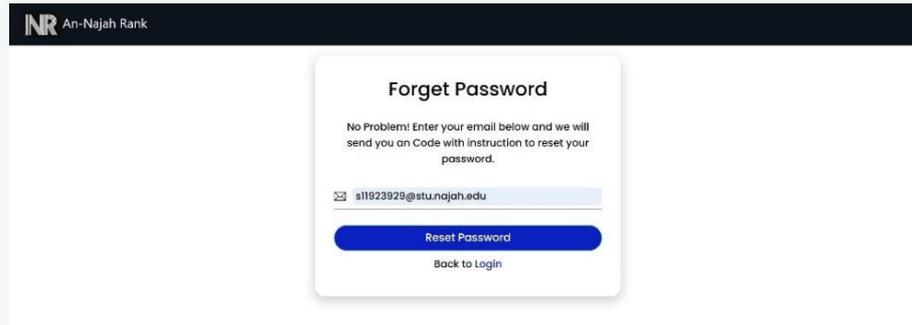


[Forgot Password ?](#)

Login

User Features

Forget password:



The screenshot shows the 'Forget Password' form. At the top left is the logo 'NR An-Najah Rank'. The form title is 'Forget Password'. Below the title is a message: 'No Problem! Enter your email below and we will send you an Code with instruction to reset your password.' There is an email input field containing 'sl1923929@stu.najah.edu'. Below the input field are two buttons: 'Reset Password' and 'Back to Login'.

NR An-Najah Rank

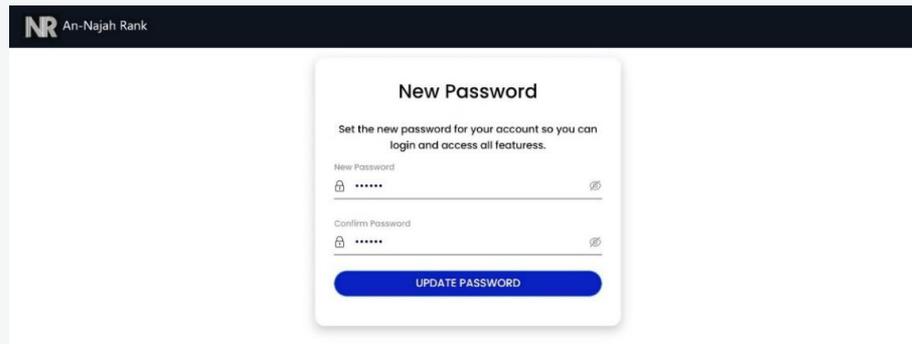
Forget Password

No Problem! Enter your email below and we will send you an Code with instruction to reset your password.

✉ sl1923929@stu.najah.edu

Reset Password

Back to Login



The screenshot shows the 'New Password' form. At the top left is the logo 'NR An-Najah Rank'. The form title is 'New Password'. Below the title is a message: 'Set the new password for your account so you can login and access all feautres.' There are two password input fields: 'New Password' and 'Confirm Password', both containing masked characters and having an eye icon to toggle visibility. Below the input fields is a button labeled 'UPDATE PASSWORD'.

NR An-Najah Rank

New Password

Set the new password for your account so you can login and access all feautres.

New Password

Confirm Password

UPDATE PASSWORD

User Features

Account Settings:

NR An-Najah Rank

Account Settings
Change your profile and account settings

Account
Password

General Info



✉ s11923929@stu.najah.edu
11923929
👤 student

Uplode image Delete Image

Full Name
Momen Odeh

Delete Accounts
Delete your account and all information related to your account such as your profile page, badges earned and leaderboard positions. Please be aware that all data will be permanently lost if you delete your account.

Delete Account

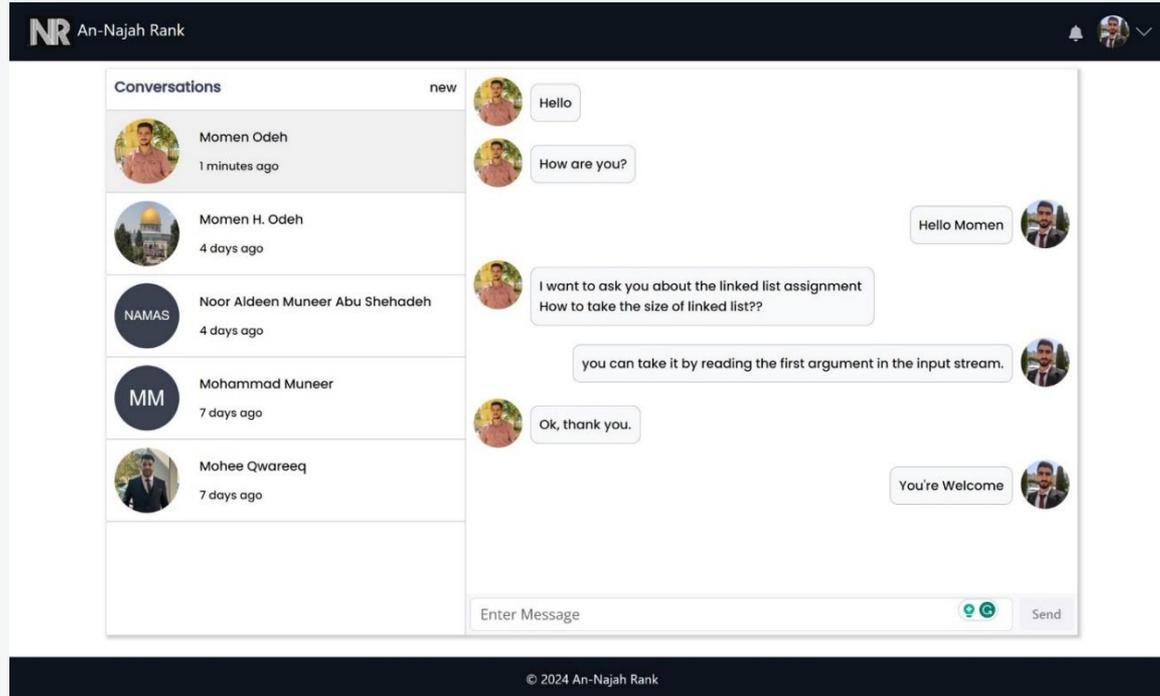
updated successfully

Save Changes

© 2024 An-Najah Rank

User Features

Chatting:



User Features

Notifications:

NR An-Najah Rank 🗨️ 🔔 👤



Momen Odeh
11923929
student
s11923929@stu.najah.edu

Edit Profile

Student Statistics

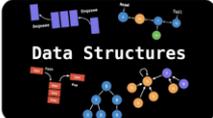
75.00% Solved	Easy	3/3	100.00%
	Medium	0/1	0%
	Hard	0/0	0%

Courses



Computer Programming

Momen H. Odeh Noor Aldeen Abu Shehadeh



Data Structure

Momen H. Odeh Noor Aldeen Abu Shehadeh

[Show all Courses](#)

New challenge added to contest in Data Structure course

Notifications

New challenge added to contest in Data Structure course
3 minutes ago

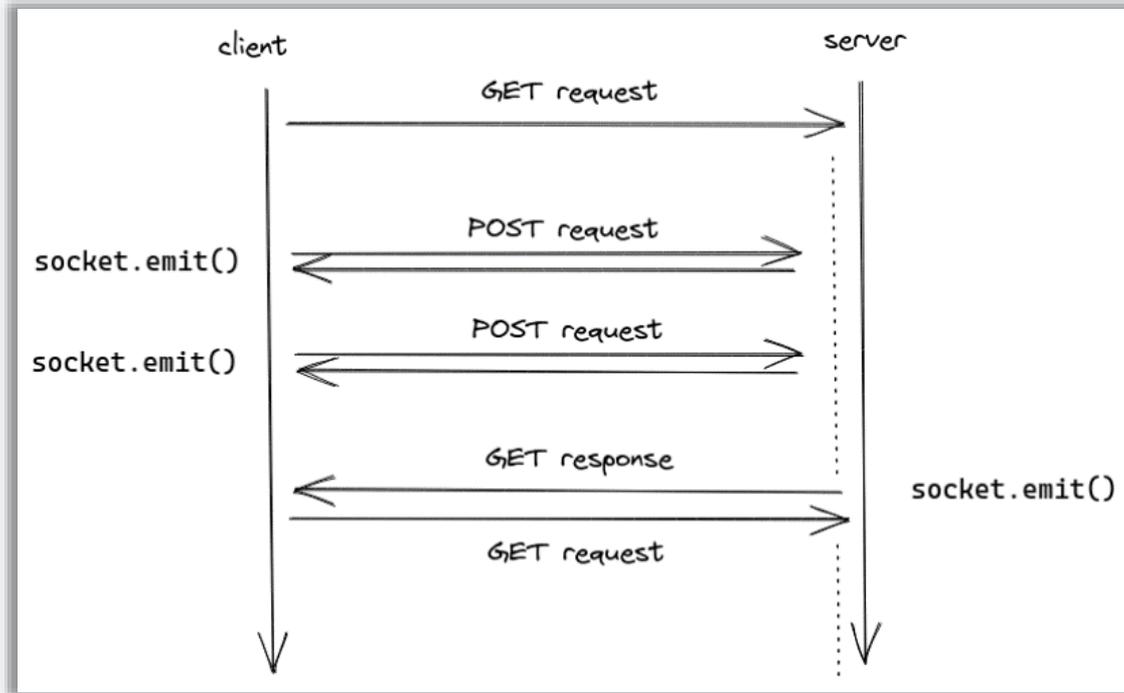
New contest added to Data Structure course
9 days ago

New challenge added to contest in Computer Programming course
9 days ago

New challenge added to contest in Computer Programming course
9 days ago

New challenge added to contest in Computer Programming course
9 days ago

Socket IO:



Professor Features

The screenshot shows the 'Mange Courses' page. At the top, there is a dark header with the 'NR An-Najah Rank' logo and navigation icons. Below the header, the breadcrumb 'administration > courses' is visible. The main heading is 'Administration'. There are two tabs: 'Manage Courses' (selected) and 'Manage Challenges'. Below the tabs is a form with a text input labeled 'Type course name' and a 'Create Course' button. At the bottom, there is a table with three columns: 'Course Name', 'Course Owner', and 'Moderators'.

Course Name	Course Owner	Moderators
Data Structure	Noor Aldeen Abu Shehadeh	Momen H. Odeh
Computer Programming	Momen H. Odeh	Noor Aldeen Abu Shehadeh

Mange Courses

The screenshot shows the 'Mange Challenges' page. It has the same header and breadcrumb as the previous page, but the breadcrumb is 'administration > challenges'. The main heading is 'Administration'. There are two tabs: 'Manage Courses' and 'Manage Challenges' (selected). Below the tabs is a form with a text input labeled 'Type challenge name' and a 'Create Challenge' button. At the bottom, there is a table with three columns: 'Challenge Name', 'Challenge tags', and 'Challenge Owner'.

Challenge Name	Challenge tags	Challenge Owner
Print Linked List In Reverse	data structure	Noor Aldeen Abu Shehadeh
Add Two Numbers		Noor Aldeen Abu Shehadeh
factorial number		Noor Aldeen Abu Shehadeh
prime number		Noor Aldeen Abu Shehadeh

Mange Challenges

Professor Features (cont.)

Course Management:

NR An-Najah Rank 🗨️ 🔔 👤

administration > courses > 10636211 > details

Data Structure

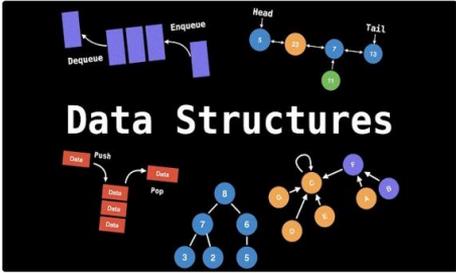
Details Moderators Course Students Manage Contests

Course Number 10636211

Course Name Data Structure

Description A data structure is a way of organizing and storing data to perform operations efficiently. It defines the relationship between data elements, the operations that can be performed on the data, and the rules for organizing

Background Image Choose File No file chosen



Cancel Changes Save Changes

© 2024 An-Najah Rank

Professor Features (cont.)

Challenge Management :

The screenshot shows the 'Print Linked List In Reverse' challenge page on the An-Najah Rank platform. The page is divided into several sections for editing the challenge details:

- Challenge Difficulty:** A dropdown menu set to 'Easy'.
- Specify Language:** Checkboxes for Java, C, C++, Python, JavaScript, and Regex. C, C++, Python, and JavaScript are currently selected.
- Challenge Name:** A text input field containing 'Print Linked List In Reverse'.
- Description:** A text area with a single asterisk (*) as content.
- Problem Statement:** A rich text editor with 'Normal' difficulty. The text reads: 'get data from input stream and build a linked list then print the linked list in reverse'.
- Input Format:** A rich text editor with 'Normal' difficulty. The text reads: 'The first line contains an integer n , the number of elements in the linked list. The next lines contain an integers for the linked list data separated by space.'
- Constraints:** A text area with a single asterisk (*) as content.
- Output Format:** A rich text editor with 'Normal' difficulty.

Professor Features (cont.)

Manage test cases in challenge

The screenshot shows the user interface for managing test cases in a challenge. At the top, the logo 'NR An-Najah Rank' is visible. The breadcrumb trail is 'administration > challenges > 47 > test-cases'. The challenge title is 'Print Linked List In Reverse'. There are two tabs: 'Details' and 'TestCases', with 'TestCases' being the active tab. An 'Add Test Case' button is located on the right. A red warning message states: '* Should add at least one sample test case to enable use this challenge.' Below this is a table with the following data:

Order	Input	Output	Is Sample	Strength	
0	3 1 2 3	3 2 1	✓	0	
1	5 3 7 2 12 10	10 12 2 7 3	✗	10	
2	6 4 5 8 9 7 12 0	0 12 7 9 8 4 5	✗	10	
3	1 5	5	✗	10	

At the bottom of the page, the copyright notice '© 2024 An-Najah Rank' is displayed.

Professor Features (cont.)

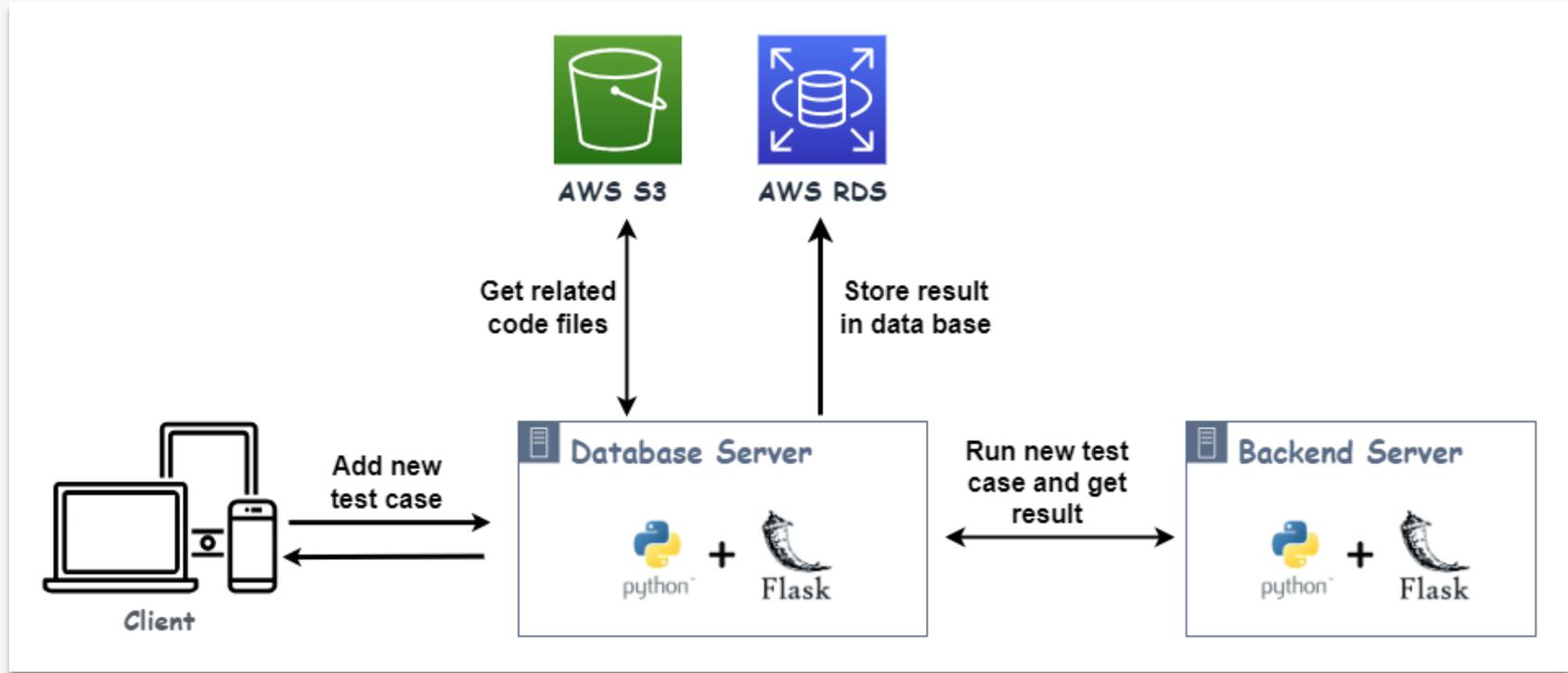
Add new test case when there is a submission for challenge

The screenshot displays the 'Add Test Case' modal dialog in the An-Najah Rank system. The dialog is overlaid on a page titled 'Print Linked List' under the path 'administration > challenges > 47 > test-cases'. The modal contains a red warning message: '* This challenge is used in courses and there is student submit code please choose the contest in course who want to run this test case on it.' Below this, a checkbox is selected for 'contest 81 - Linked List in course 10636211 - Data Structure.'. The 'Strength' is set to 10, with a 'Sample' checkbox. The 'input' field contains two lines: '1 1' and '2 2'. The 'output' field contains one line: '1 2'. A 'Save' button is at the bottom of the modal. The background page shows a table with columns 'Order' and 'Input' and a list of test cases.

Order	Input
0	3 1 2
1	5 3 7
2	6 4 5 8
3	1 5
4	1 2

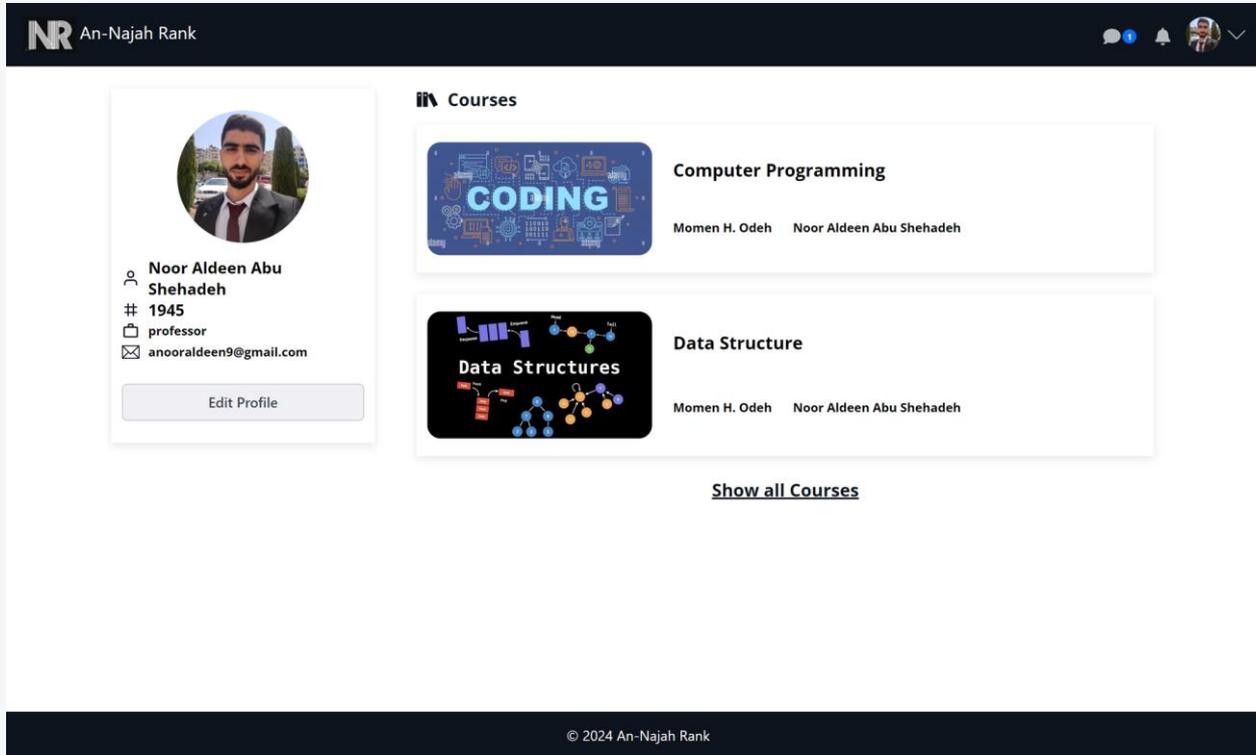
© 2024 An-Najah Rank

Add new test case when there is a submission for challenge (cont.)



Professor Features (cont.)

Profile:



NR An-Najah Rank

Profile:

Noor Aldeen Abu Shehadeh
1945
professor
anooraldeen9@gmail.com

[Edit Profile](#)

Courses

- Computer Programming**
Momen H. Odeh Noor Aldeen Abu Shehadeh
- Data Structure**
Momen H. Odeh Noor Aldeen Abu Shehadeh

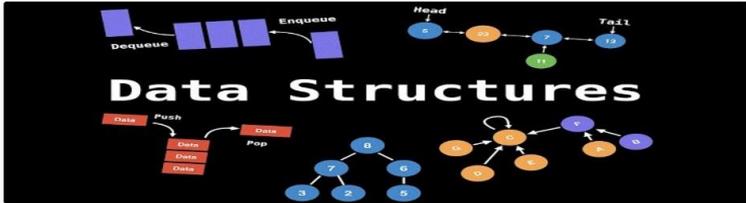
[Show all Courses](#)

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Professor Features (cont.)

Course View:

NR An-Najah Rank



courses > 10636211

Data Structure

Description

A data structure is a way of organizing and storing data to perform operations efficiently. It defines the relationship between data elements, the operations that can be performed on the data, and the rules for organizing the data. Different types of data structures serve various purposes, and their selection depends on the specific requirements of a task or problem.

Contests Course Students

Contests Add Contest

Linked List 10 days 0 hours 56 minutes 22 seconds

Solved Rate: **5.66%** max Score: **25** View Contest

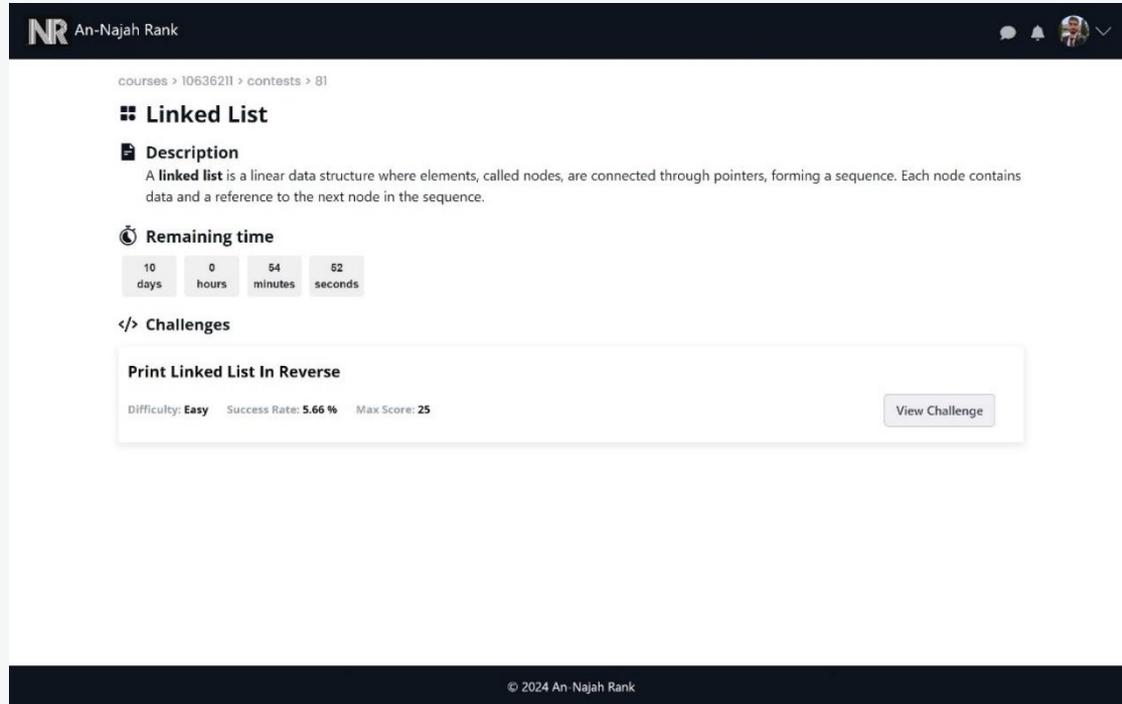
Tree Start After 9 days 23 hours 22 minutes 22 seconds

Solved Rate: **0%** View Contest

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Professor Features (cont.)

Contest View:



The screenshot displays the user interface of the An-Najah Rank website. At the top, there is a dark navigation bar with the logo 'NR An-Najah Rank' on the left and user profile icons on the right. Below the navigation bar, a breadcrumb trail reads 'courses > 10636211 > contests > 81'. The main content area features a section titled 'Linked List' with a description: 'A linked list is a linear data structure where elements, called nodes, are connected through pointers, forming a sequence. Each node contains data and a reference to the next node in the sequence.' Below the description is a 'Remaining time' section with a timer showing 10 days, 0 hours, 54 minutes, and 52 seconds. Underneath is a 'Challenges' section containing a challenge titled 'Print Linked List In Reverse'. The challenge details include 'Difficulty: Easy', 'Success Rate: 5.66%', and 'Max Score: 25'. A 'View Challenge' button is located to the right of these details. At the bottom of the page, a dark footer contains the copyright notice '© 2024 An-Najah Rank'.

NR An-Najah Rank

courses > 10636211 > contests > 81

Linked List

Description

A **linked list** is a linear data structure where elements, called nodes, are connected through pointers, forming a sequence. Each node contains data and a reference to the next node in the sequence.

Remaining time

10 days 0 hours 54 minutes 52 seconds

Challenges

Print Linked List In Reverse

Difficulty: **Easy** Success Rate: **5.66 %** Max Score: **25**

[View Challenge](#)

© 2024 An-Najah Rank

Professor Features (cont.)

Challenge submission View:

The screenshot shows the 'An-Najah Rank' interface for viewing challenge submissions. At the top, there is a navigation bar with the logo and user profile. Below it, a breadcrumb trail reads 'courses > 10636211 > contests > 81 > challenges > 47 > submissions'. The main heading is 'Print Linked List In Reverse'. There are three tabs: 'Problem', 'Submissions' (which is active), and 'Leaderboard'. A search box labeled 'Type student name' and a 'Calculate Similarity' button are present. A table displays submission data for three students, with columns for Name, Date, Score, and Similarity. Each row includes 'View Submissions' and 'View Similarity' buttons. A notification box at the bottom left states 'Similarity data ready for submissions in Data Structure course'. The footer contains the copyright notice '© 2024 An-Najah Rank'.

courses > 10636211 > contests > 81 > challenges > 47 > submissions

Print Linked List In Reverse

Problem Submissions Leaderboard

Type student name Calculate Similarity

Name	Date	Score ▼▲	Similarity ▼▲		
Noor Aldeen Muneer Abu Shehadeh	Wed, 10 Jan 2024 16:15:26 GMT	$\frac{25}{25}$	71%	View Submissions	View Similarity
Mohammad Muneer	Wed, 10 Jan 2024 17:40:29 GMT	$\frac{25}{25}$	64%	View Submissions	View Similarity
Momen Odeh	Wed, 10 Jan 2024 17:40:48 GMT	$\frac{25}{25}$	30%	View Submissions	View Similarity

Similarity data ready for submissions in Data Structure course

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Professor Features (cont.)

Challenge student submissions View:

The screenshot shows the submission view for a challenge on the An-Najah Rank platform. The page is titled "Submission 2" and "Submission 1". The submission details show it was submitted on 1/10/2024 at 9:23:44 PM with a score of 100 out of 100. The submitted code is in Java and implements a simple loop that prints the number 1. The submission passed all three test cases, each with a score of 33.3%.

Submission 2 Submission 1

Submission Details

Submitted at: 1/10/2024, 9:23:44 PM

Score out of 100: 100 Save Changes

Submitted Code

Language: java

```
1 import java.io.*;
2 import java.util.*;
3
4 class Main {
5
6     public static void main(String[] args) {
7         Scanner in = new Scanner(System.in);
8         int num = in.nextInt();
9         int res = 1;
10        for(int i=1 ; i<=num ; i++)
11        {
12            res*= i;
13        }
14        System.out.println(res);
15    }
16 }
```

TestCase 0 (0.0%) ✓ TestCase 1 (33.3%) ✓ TestCase 2 (33.3%) ✓ TestCase 3 (33.3%) ✓

Congratulations, you passed the sample test case.

Input (stdin)

1

Your Output (stdout)

1

Expected Output

1

© 2024 An-Najah Rank

Professor Features (cont.)

Challenge student similarity View:

NR An-Najah Rank



[courses > 10636211](#) > [contests > 81](#) > [challenges > 47](#) > [submissions > code-similarity > 11923513](#)

Code Similarity Summary

Noor_Aldeen_Muneer_Abu_Shehadeh-11923513 (71%)	Mohammad_Muneer-11235499 (58%)	...
<pre>10 struct Node* insertNode(struct Node* head, int data) { 11 struct Node* newNode = (struct Node*)malloc(sizeof(struct 12 newNode->data = data; 13 newNode->next = NULL; 14 15 if (head == NULL) { 16 return newNode; 17 } 18 19 struct Node* current = head; 20 while (current->next != NULL) { 21 current = current->next; 22 } 23 24 current->next = newNode; 25 return head; 26 } 27 void printReverse(struct Node* head) {</pre>	<pre>9 struct Node* insertNode(struct Node* head, int data) { 10 struct Node* newNode = (struct Node*)malloc(sizeof(struct 11 newNode->data = data; 12 newNode->next = head; 13 return newNode; 14 } 15 16 void printReverse(struct Node* head) { 17 if (head == NULL) { 18 return; 19 } 20 printf("%d ", head->data); 21 printReverse(head->next); 22 } 23 24 int main() { 25 int size; 26 scanf("%d", &size);</pre>	

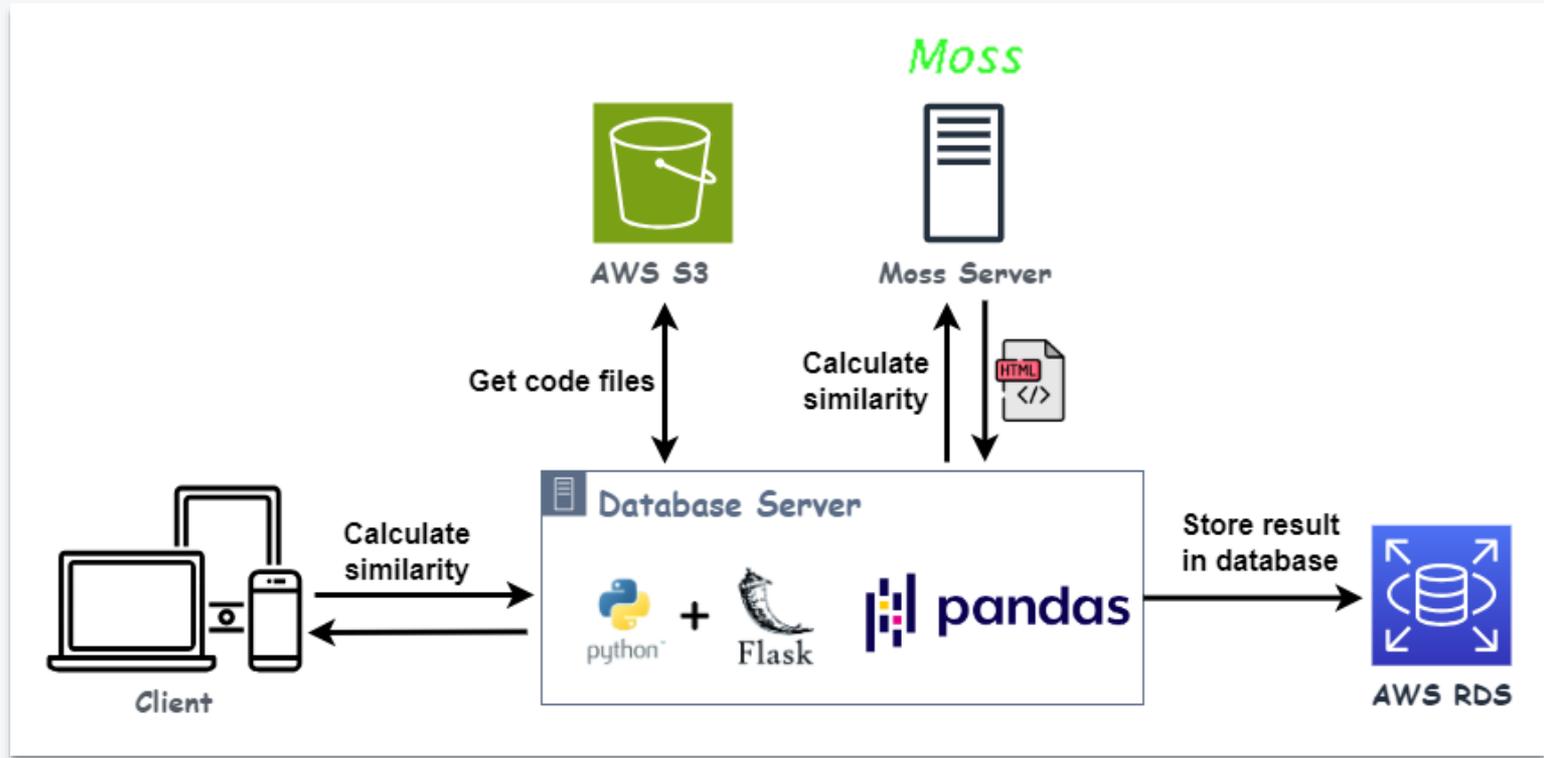
Mohammad_Muneer-11235499 (58%)

...

Mohammad_Muneer-11235499 (58%)

Momen_Odeh-11923929 (43%)

Challenge student similarity View (cont.):



Student Features

Student Profile:

NR An-Najah Rank 🗨️ 🔔 👤



Momen Odeh
11923929
student
s11923929@stu.najah.edu

Edit Profile

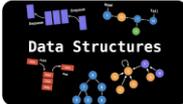
Student Statistics

Easy	3/4	75.00%
Medium	0/1	0%
Hard	0/0	0%

Courses



Computer Programming
Momen H. Odeh Noor Aldeen Abu Shehadeh



Data Structure
Momen H. Odeh Noor Aldeen Abu Shehadeh

[Show all Courses](#)

</> Latest Challenges

factorial number

Difficulty: **Easy** Success Rate: **0%** Max Score: **25**

Solve Challenge

Student Features

Solving challenge:

NR An-Najah Rank

courses > 10636211 > contests > 81 > challenges > 47 > problem

Print Linked List In Reverse

Problem Submissions Leaderboard

Difficulty: **Easy**
Max Score: **25**
Total Submission: **1**

Input Format
The first line contains an integer , the number of elements in the linked list.
The next lines contain an integers for the linked list data separated by space.

Constraints
-

Output Format
an integers of reverse linked list data separated by space.

Simple Input 0
3
1 2 3

Sample Output 0
3 2 1

Explanation 0
this is a sample of reverse print linked list.

Dark mode: C

Dark mode: C

```
1 #include <stdio.h>
2 #include <string.h>
3 #include <math.h>
4 #include <stdlib.h>
5
6 struct Node {
7     int data;
8     struct Node* next;
9 };
10 struct Node* insertNode(struct Node* head, int data) {
11     struct Node* newNode = (struct Node*)malloc(sizeof(struct Node));
12     newNode->data = data;
13     newNode->next = NULL;
14
15     if (head == NULL) {
16         return newNode;
17     }
18
19     struct Node* current = head;
20     while (current->next != NULL) {
21         current = current->next;
```

Run Code Submit Code

TestCase 0 ✓

Congratulations, you passed the sample test case.

Input (stdin)
3
1 2 3

Your Output (stdout)
3 2 1

Expected Output
3 2 1

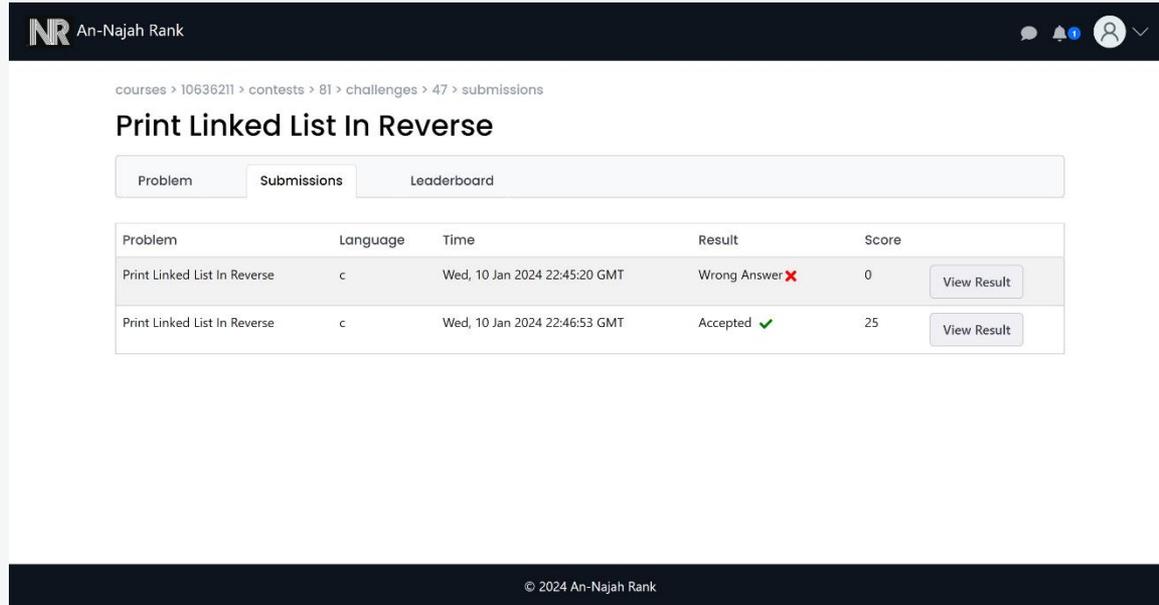
© 2024 An-Najah Rank

Code operation:

Language	Compiler/Interrupter
C/C++	 The logo for the GNU Compiler Collection (GCC), featuring a cartoon cow and the letters "GCC" in a stylized font.
Java	 The logo for the Java Development Kit (JDK), featuring a blue flame above a blue coffee cup and the text "Java Development Kit" in red.
Python	 The logo for Python, featuring two interlocking snakes, one blue and one yellow, above the word "python" in a lowercase, sans-serif font.
JavaScript	 The logo for Node.js, featuring the word "node" in a bold, lowercase font with a green hexagon above the letter "o", and a green hexagon with "JS" inside below it.

Student Features

Student submission:



The screenshot shows the user interface for a student submission on the An-Najah Rank platform. At the top, the navigation bar includes the 'NR An-Najah Rank' logo and user profile icons. The breadcrumb trail indicates the path: 'courses > 10636211 > contests > 81 > challenges > 47 > submissions'. The main heading is 'Print Linked List In Reverse'. Below this, there are three tabs: 'Problem', 'Submissions', and 'Leaderboard', with 'Submissions' being the active tab. A table displays the submission details:

Problem	Language	Time	Result	Score	
Print Linked List In Reverse	c	Wed, 10 Jan 2024 22:45:20 GMT	Wrong Answer ❌	0	<button>View Result</button>
Print Linked List In Reverse	c	Wed, 10 Jan 2024 22:46:53 GMT	Accepted ✅	25	<button>View Result</button>

At the bottom of the page, the footer contains the copyright notice: '© 2024 An-Najah Rank'.

Student Features

Student submission (cont.):

NR An-Najah Rank 🗨️ 🔔 👤 ✓

[courses > 10636211](#) > [contests > 81](#) > [challenges > 47](#) > [submissions > 26](#)

Print Linked List In Reverse

Problem Submissions Leaderboard

Submission Details

Submitted at: 1/10/2024, 6:15:26 PM
Score: 25

✓ Test Case #0 ✓ Test Case #1 ✓ Test Case #2 ✓ Test Case #3

Submitted Code

Language: c Open in editor

```
1 #include <stdio.h>
2 #include <string.h>
3 #include <math.h>
4 #include <stdlib.h>
5
6 struct Node {
7     int data;
8     struct Node* next;
9 };
10 struct Node* insertNode(struct Node* head, int data) {
11     struct Node* newNode = (struct Node*)malloc(sizeof(struct Node));
12     newNode->data = data;
13     newNode->next = NULL;
14
15     if (head == NULL) {
16         return newNode;
17     }
18
19     struct Node* current = head;
20     while (current->next != NULL) {
21         current = current->next;
```

Admin Features

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admin > professors-requests

Welcome Back

Professors Requests Professors Students Submissions

professors request

Type Professor Name

Professor Name	University Number	Email		
Noor Aldeen Abu Shehadeh	1945	anooraldeen9@gmail.com	✓	✗
Momen H. Odeh	11072	momen.odeh74@gmail.com	✓	✗

pending professors

NR An-Najah Rank

admin > submissions

Welcome Back

Professors Requests Professors Students **Statistics**

Submissions

Type Student Name

Student Name	University Number	Total Submission	Total Success Submission	Rate
Noor Aldeen Muneer Abu Shehadeh	11923513	4	4	100.00%
Momen Odeh	11923929	4	3	75.00%
Mohammad Muneer	11235499	1	1	100.00%

Students statistics

Sample of responsive design

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Conversations new

-  **Momen Odeh**
1 days ago
-  **Momen H. Odeh**
5 days ago
-  **Noor Aldeen Muneer Abu Shehadeh**
5 days ago
-  **Mohammad Muneer**
8 days ago
-  **Mohee Qwareeq**
8 days ago

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>

-  Hello
-  How are you?
 Hello Momen
-  I want to ask you about the linked list assignment
How to take the size of linked list??
 you can take it by reading the first argument in the input stream.
-  Ok, thank you.
 You're Welcome

Enter Message Send

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administration > courses > create-course

Create Course

Course Number

Course Name

Description

Background Image
Choose File No file chosen

Students Excel File
Choose File No file chosen
* should enter Students Excel File with .xlsx extension

Cancel Changes Save Changes

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Noor Aldeen Abu Shehadeh
1945
🏠 professor
✉ anooraldeen9@gmail.com

Edit Profile

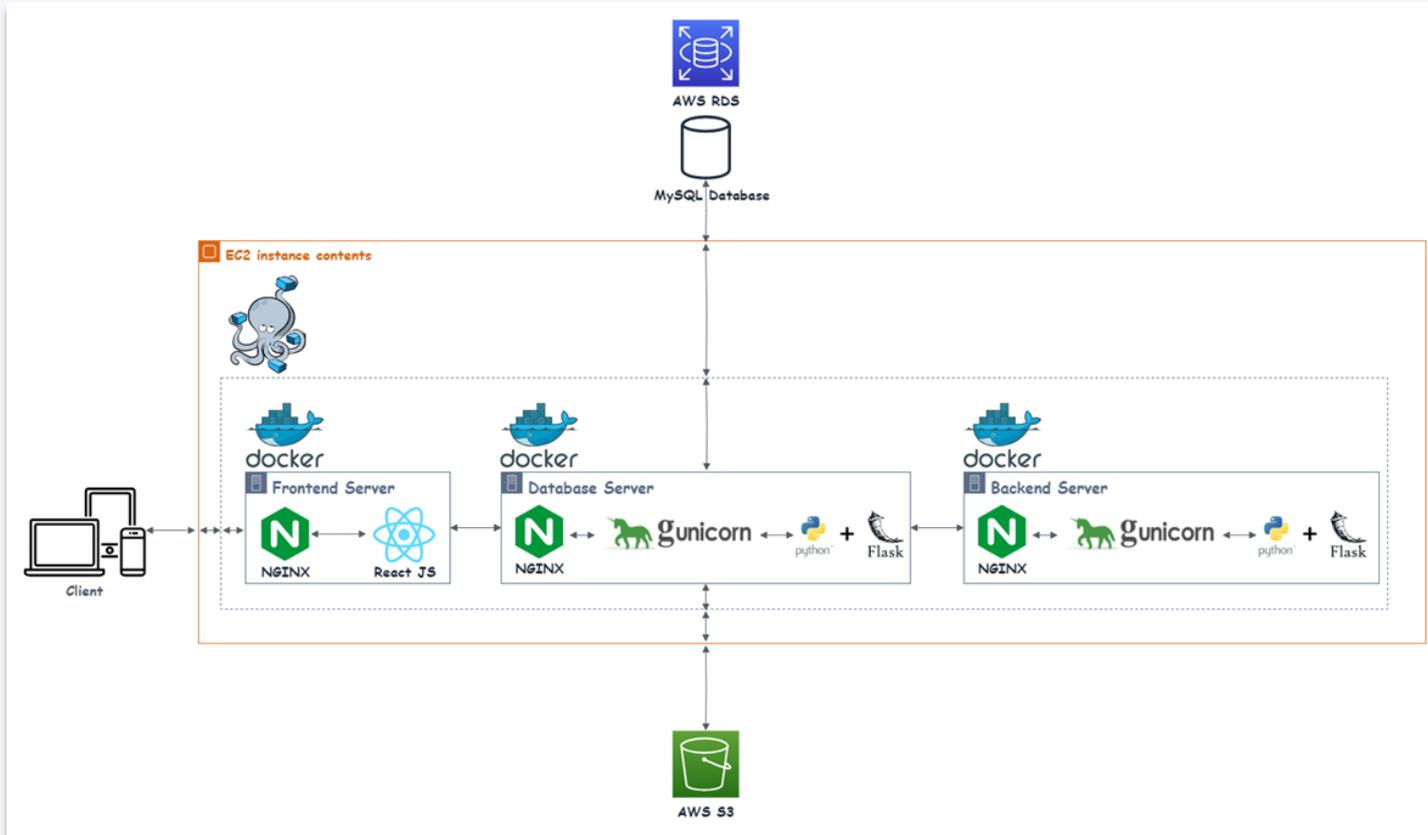
Courses

-  **Computer Programming**
Momen H. Odeh
Noor Aldeen Abu Shehadeh
-  **Data Structure**
Momen H. Odeh
Noor Aldeen Abu Shehadeh

[Show all Courses](#)

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Deployment Phase



Testing Phase

After implementing the project, we conduct manual testing for all features in the system to ensure that all features work correctly.



Future Works

- ❑ Support time complexity calculation for the submission code of the challenge.
- ❑ Support creating a challenge related to image processing.



Thank You !