



## Cover page

Project title: Holy Land Juices.

Academic Year: 2023.

Group Members: Israa Odeh, Raghad Sabri.

Department Name: Computer Engineering.

Project Type: Hardware.

Supervisor Name: Dr. Raed Qadi.

### Format:

- Single space, Times New Roman.
- 12 pt,
- Maximum 1 page.

### Abstract Body:

#### Items must be provided in the Abstract:

- Why do you think this project is important? Please explain the significance of this Project in brief.
- In your point of view what are the important aspects that should be covered in the project?
- Objective(s): In your view, please explain the main objectives of the project.
- Methodology: Give a brief outline of the application development process.
- Had this project been done before? Are there any similar applications available today?
- **Note:** Please deliver this abstract early to ensure that your Project has been approved by the department's projects committee. **Registration will not be done without this approval.**



## Project's Abstract:

Nowadays, there are numerous companies involved in juice manufacturing, like National Beverage Company Coca-Cola/Cappy (NBC) and water bottling companies. These companies rely on automating the filling and production process to produce a wide variety of drinks in large quantities with high precision. However, manual methods of filling and packaging, such as street drink vendors with carts, would require significant time and effort, and the maximum production capacity per day would not suffice to meet the customer demand effectively. And they may not maintain the same level of quality and consistency because it is challenging to achieve precise proportions of juice and water manually every time. However, in our project, we will ensure that we maintain consistent levels of liquid and quality, thereby preserving customer loyalty and safeguarding the products. Therefore, there is a need to automate this manual process by implementing an automated production line. Our solution is to create a juice production line consisting of three main parts: filling juice bottles with specific concentrations, packaging them, and placing them in designated boxes. The ultimate goal is to automate the juice production process, reducing the need for manual labor.

With the growing market demand for a wide range of drinks, it has become challenging to address all customer demands manually using human resources alone. Consequently, it is essential to explore alternatives that reduce the dependence on human workers and rely more on automated precision. This approach not only lowers production costs but also leads to more affordable prices, enabling businesses to adapt to the increasing demands effectively.

The project will be divided into three key stages. Firstly, the overall design of the project will be created, ensuring a comprehensive plan is in place. Next, the project hardware will be physically constructed, bringing the design to life. Finally, the necessary connections and code will be implemented to ensure the seamless integration of all components, ensuring the project works harmoniously as a unified entity.

This will be accomplished by creating an "Arduino-based automatic bottle filling and capping system." The system utilizes Arduino programming to control and manage the entire process. This is achieved through the integration of various components such as sensors, relay switches, DC motors, and other relevant elements.

Numerous studies on automatic filling and capping juice machines have been conducted in recent decades. Smith et al. [1] propose a strategy involving a conveyor belt to transport empty bottles to the filling station, followed by the capping section. Once filled and capped, the bottles move to the packaging area. This process, monitored by a human interface (HMI), optimizes performance and increases productivity based on bottle size and shape, while reducing manpower and energy consumption.



**References:**

- [1]: Joseph Smith, et. al. “Automatic Adjustable Filling and Capping Machine Using Programmable Logic Controller and Human Interface.” IOSR Journal of Mechanical and Civil Engineering (IOSRJMCE), 17(6), 2020, pp. 23-44.