Team Project: Vending Machines

Group: 1

Object Oriented Programming

Team 3

- Daniel Elias Becerra - A01208905
- Hugo David Franco Avila - A01654856
- Roberto Nuñez Alanis - A01205559

Teacher: Silvana De Gyvés

01/05/2018

INTRODUCTION

For the team project of Object Oriented Programming, we were asked to make a program that simulated a vending machine. It had to have a Graphical User Interface (GUI), and a logic package where everything would interact to make the machines work properly.

The first thing we did as a team was making sure we understood the task. We looked up some pictures of vending machines to get a grasp on what we needed to do. There is the aesthetic part of a vending machine (how it looks) and the functioning part (how it works). It works by receiving money or any other kind of payment from a user (tokens, tickets, etc.), and after the user selects a product from the machine, it gives it to him, and if the user introduced more money than the product cost, he will get change.

We based our machines off this description, and decided to have one machine filled with technology (headphones, etc.) and the other machine with food (fruit, bars, etc.)

PROJECT DESCRIPTION

The project is called Vending Machines, it consists of 2 vending machines where a user can get 2 types of products, technology and food. It was developed in Java using the Object-Oriented Paradigm.

It has a GUI where the user can interact with the program, by clicking on the different buttons he will execute an action.

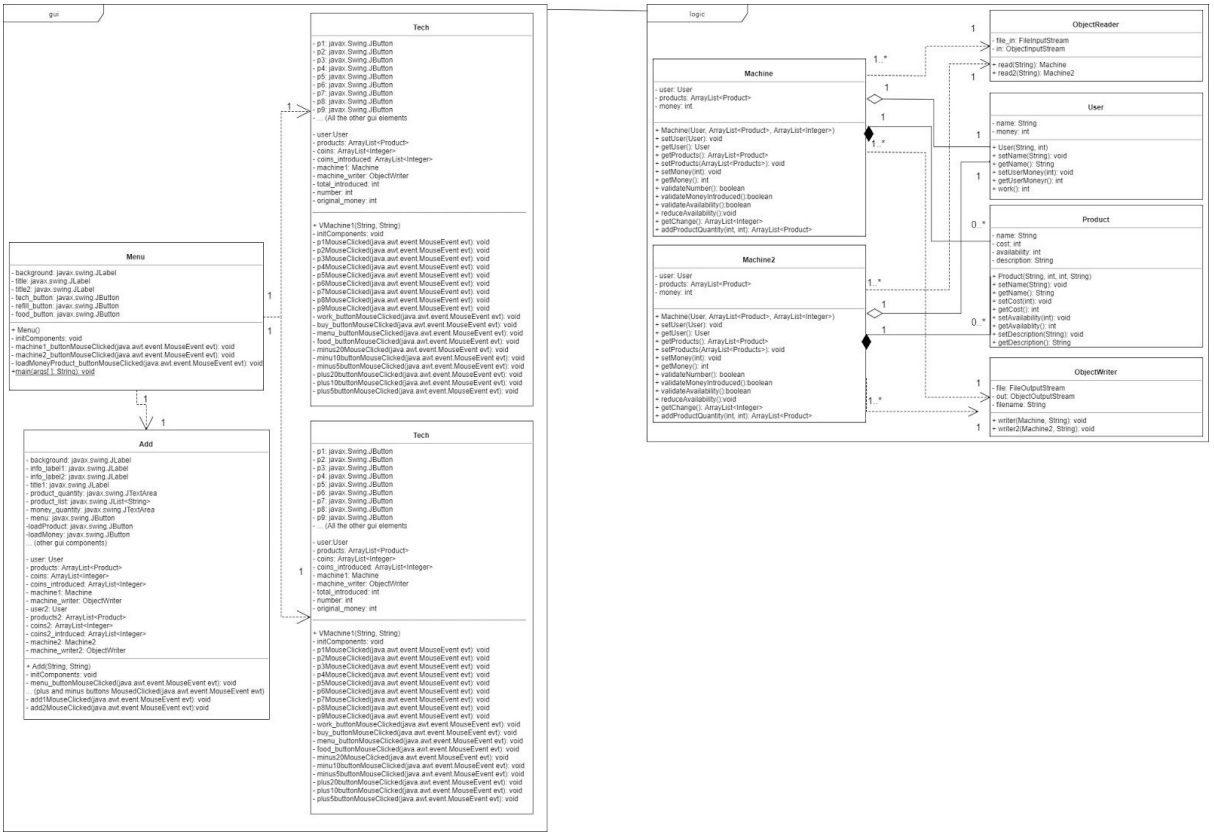
The vending machines work as they would in real life, asking for money when the user tries to select a product, giving change to the user if he provides more money than the actual cost, telling the user he needs to introduce more money if the cost isn't covered with what he had entered, checking for availability of a certain product, just like a real life vending machine.

FEATURES

- It has a graphical user interface (GUI) so the user can interact visually with the program.
- The user can choose between two vending machines, one with food products and the other with technology products.

- The machine will validate if the amount the user introduced is correct, if it is, he will get the product, if it isn't, he will be asked to introduce more money.
- If the user runs out of money, he has the ability to "work", so he can get more money.
- The status of the machine (money store, products, availability of the products, etc.) will be stored in files, where after each use is going to be updated and will relaunch with the attributes it had the last time it was used.
- The user will be able to check the products' availability, price and description.
- The machine receives coins of 20, 10, and 5 dollars, and needs to be filled with cash so it can give change to the user
- There is a menu where the user can introduce more products and more money.

CLASS DIAGRAM



MOCKUPS

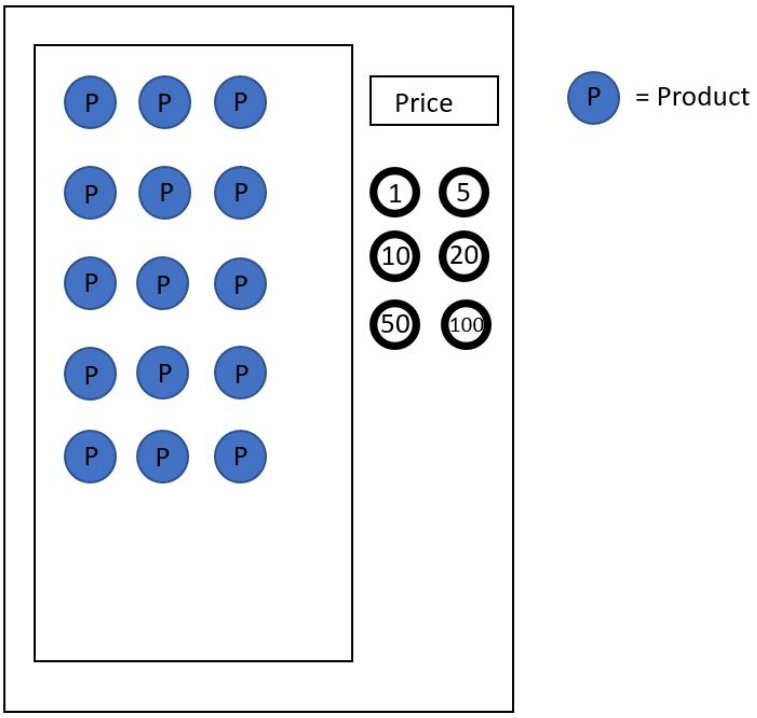


Figure 1. Very early prototype for the UI

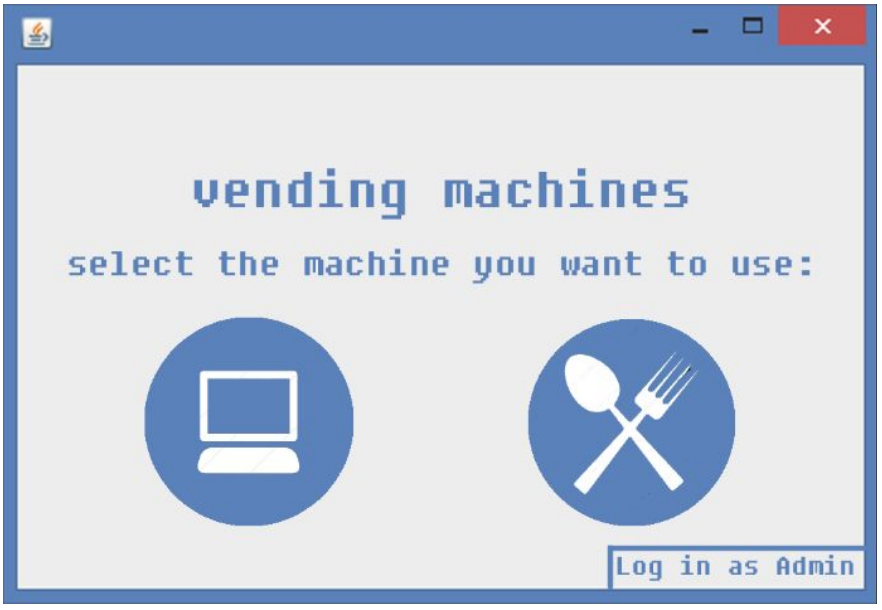


Figure 2. Project Proposal main UI mockup

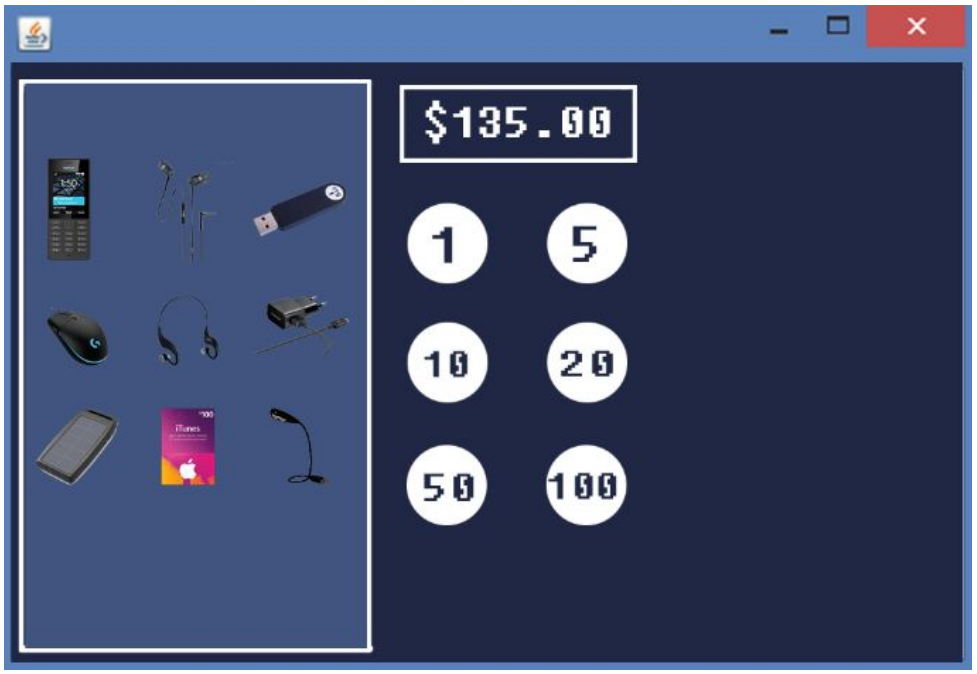


Figure 3. Proposal vending machine interface

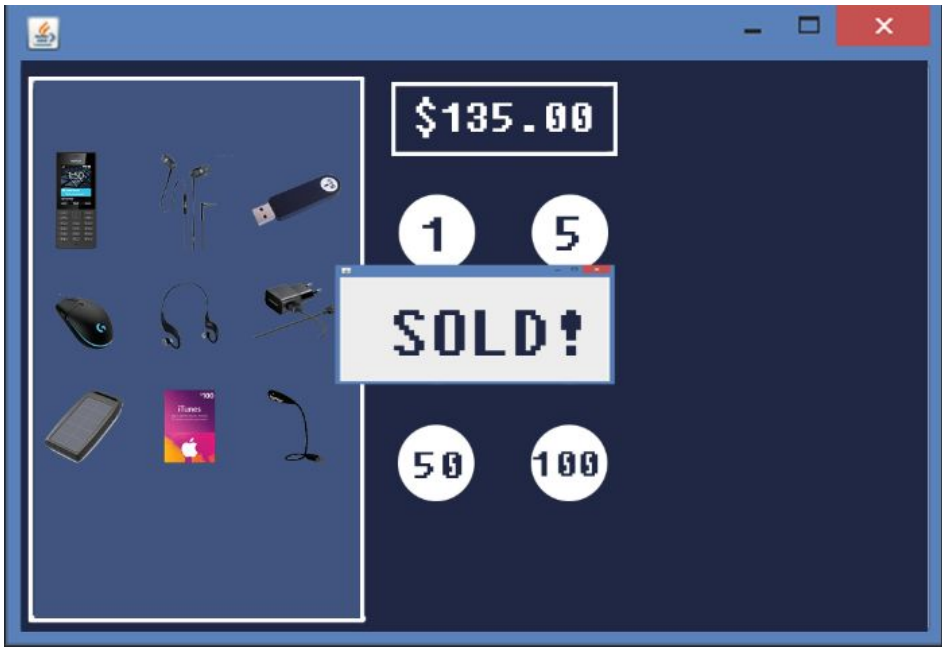


Figure 4. Sale confirmation

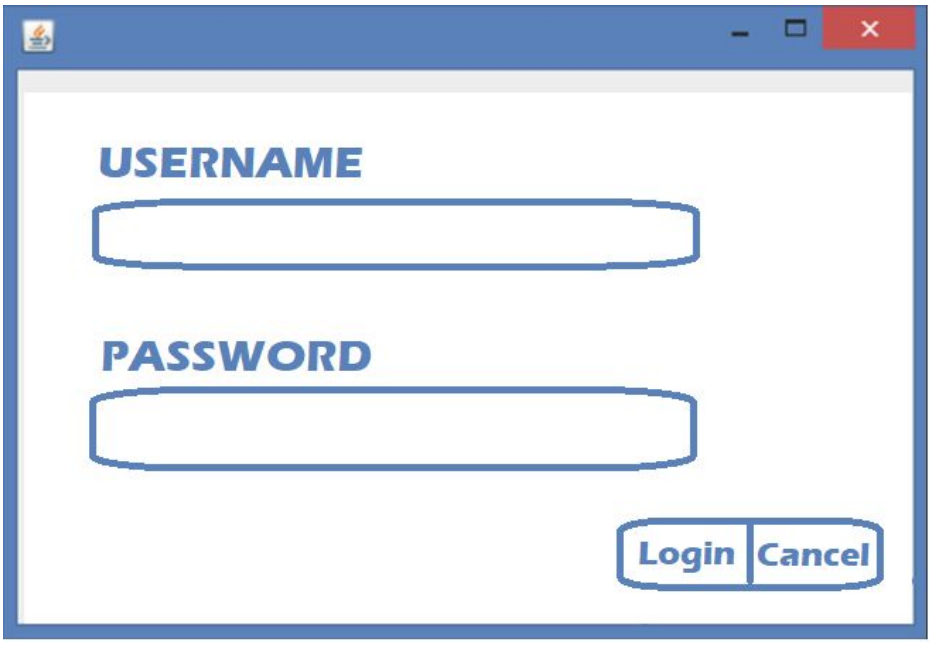


Figure 5. Login UI to access the machine components

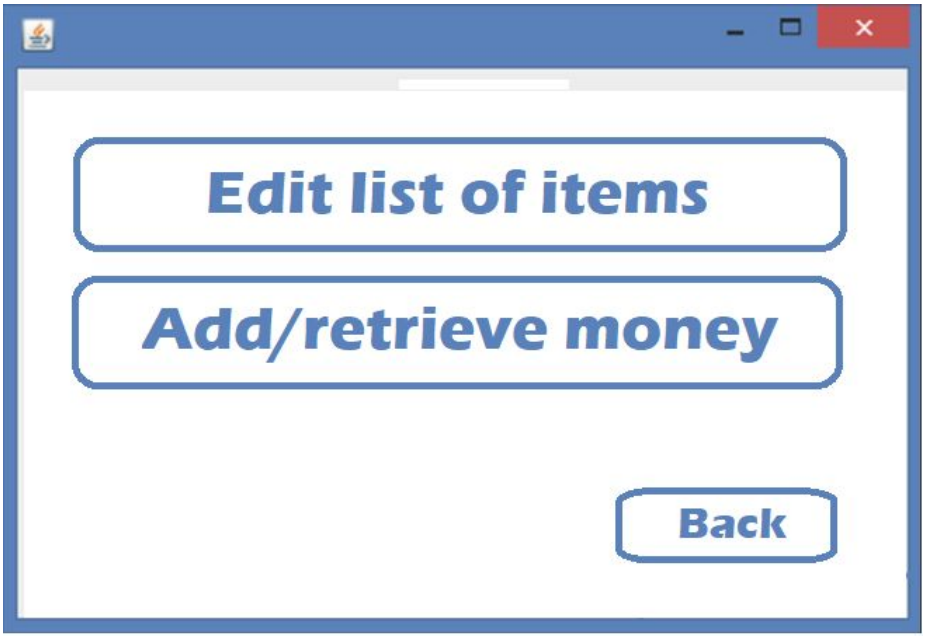


Figure 6. Edit machine UI

Figure 7. Final design of main UI

Figure 8. Food machine UI

Figure 9. Technology machine

OBJECT-ORIENTED ANALYSIS AND DESIGN

- The first step was the analysis, we sat as a team and discussed the task, to see if we had a similar vision of what was asked.
  The main requirements were:
  - ❖ Two vending machines with a graphical user interface (GUI) to interact with them.
  - ❖ Products information and available money had to be displayed
  - ❖ It should behave like a real vending machine (ie. give change if more money than required is introduced, tell the user if he hasn't entered enough money, etc.)

- Next we had to make a design that complemented our vision. For this we did some Paint sketches where we had a very basic idea of how we wanted our final product to look like.

  Our first GUI mockup looked really dull with dark colors, and a basic input system, we had a screen that asked if you wanted to see the food or the technology machines and displayed something similar to the side of a vending machine, with the buttons on the right and the products on the left.

That design was done for the Project Proposal, after we were allowed to continue with the development of our program, we did some designs with more advanced tools, like Photoshop, that we used for the final version. We added colors and a vibrant color palette to make our interface look nice and interesting

- The implementation of our program was a little complicated because we were working in different places and we needed to make all the classes come together and interact with each other nicely. We split the work so each of us could work with what we believe is our strength, and the results reflect that.

  We reused some of the classes from earlier codes, like the object reader and object writer so we could serialize objects properly. We used the mockups as the background for the UI, and added buttons and labels to complement the UI.

  The Machine classes implement methods that make the machine work properly, like a money validation method, a product validation method, etc. We wrote the code for two different Machine classes, Machine and Machine2, so one could act as the food machine an the other as the technology machine. We also wrote a class for User and Product, and defined their attributes and methods.

- The final phase of the development process, testing, was conducted by each of the members of the team. We didn't have a specific methodology to do it, we just tested the functions as if we were normal users, and tried to find any bug so we could fix it before we uploaded the code.

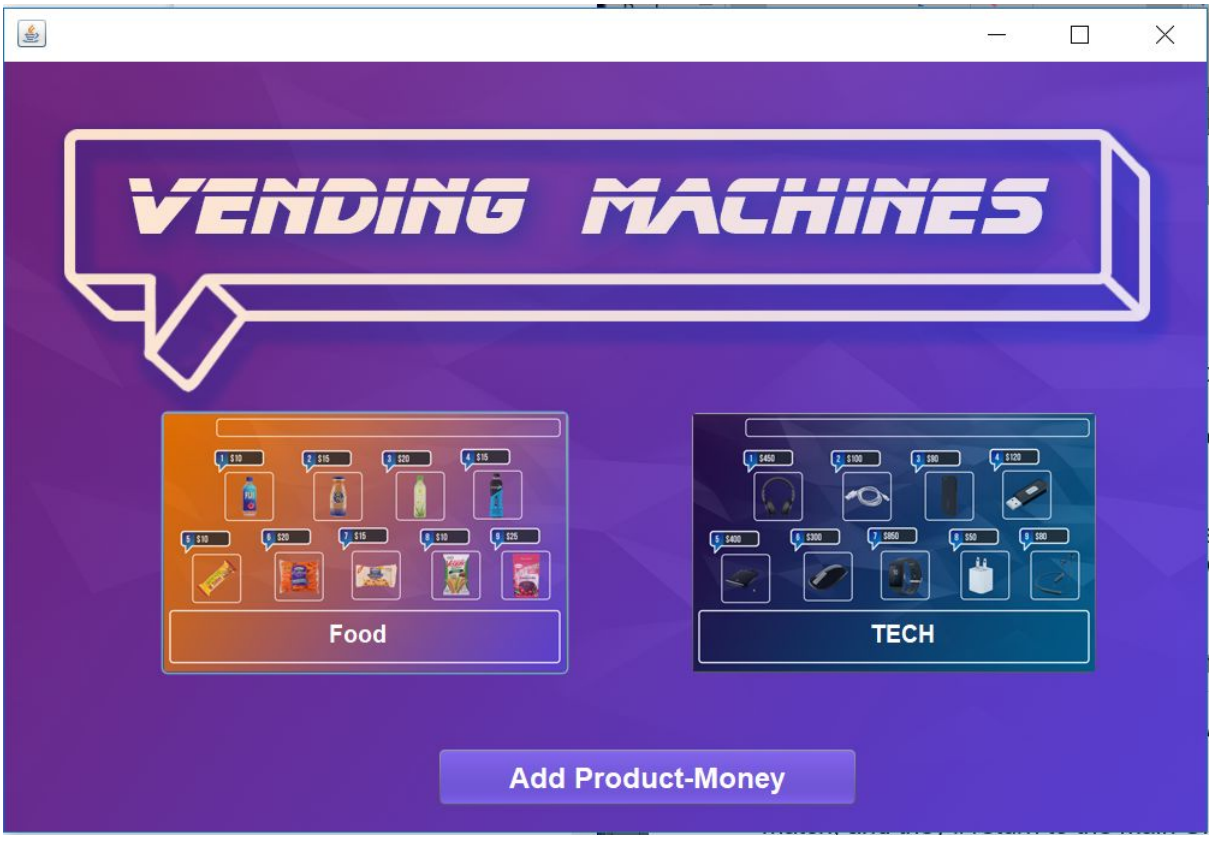
  Everything seemed to work as intended, we were not able to find any bug, either big or small, therefore our development process was finished.

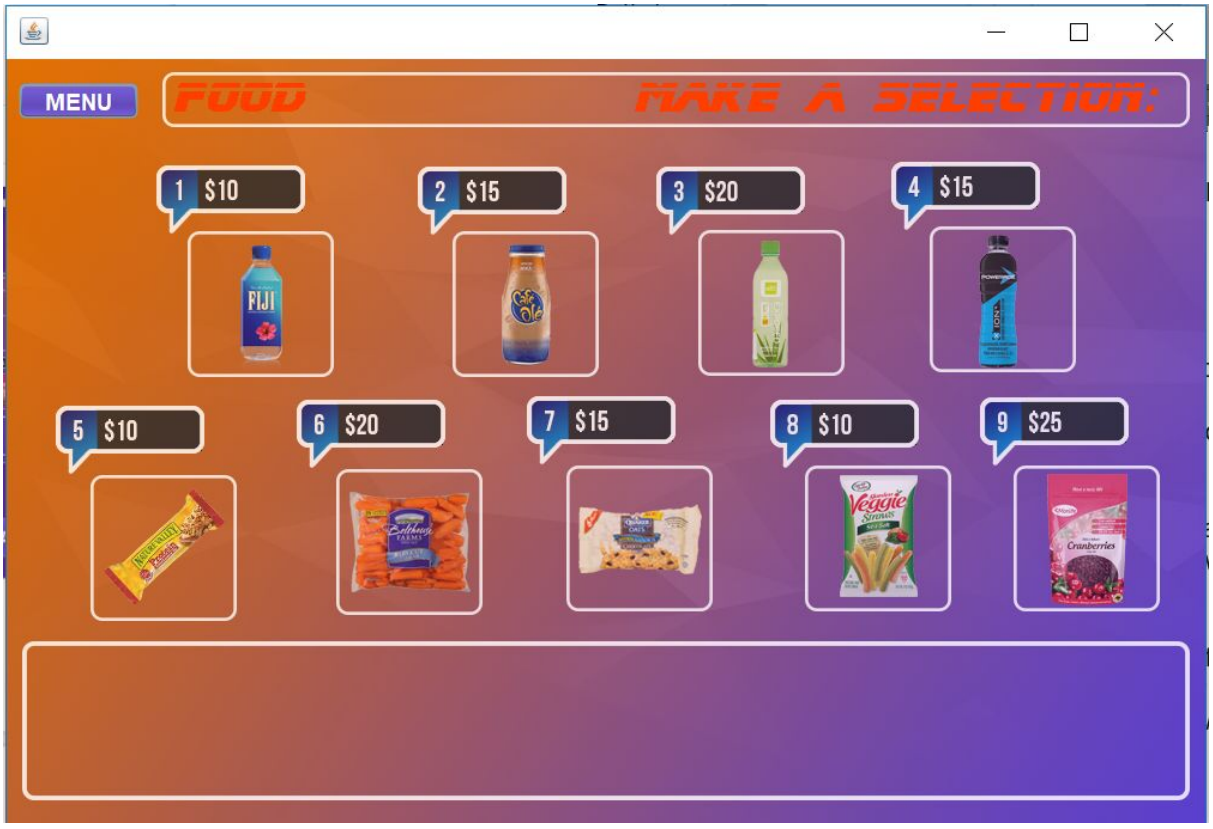
INSTRUCTIONS

1. To run the code, you need to open the project inside the NetBeans IDE, the project is called VendingMachines
2. After opening the project, you need to click on the Run Project button (green play button), or click F6.
3. The main UI will be displayed.
4. The user has the ability to enter 3 different sections, the food machine, the technology machine, or the add money/products menu.

5. If the user clicks on the food machine, he will be taken to a different screen, where he will be able to visualize the products in the machine.
6. There, he has the choice to pick a product or return to the main menu. If he chooses a product, he needs to enter enough money to buy it, the UI will notify the user if he has introduced enough money to buy a certain product.
7. If he chooses to buy it, the UI will tell the user how much changed will be returned to him, and after clicking the “buy another thing” button, he will be taken back to the main UI.
8. The tech machine works exactly as the food one, the only difference is what kind of products you can expect to find in them.
9. Given that the tech products are much more expensive than food, the user might run out of money, however, if he clicks on the work button, he will have 100 dollars added to his account, because if you work you earn money, just like in real life!
10. If the user clicks on the “Add Product-Money” button, he will be taken to a screen where he can pick which product he wants to add more of to the machine, and how many more of it, and he can also add money to the machine, so it doesn’t run out of change. He can either modify the food machine, or the tech one.

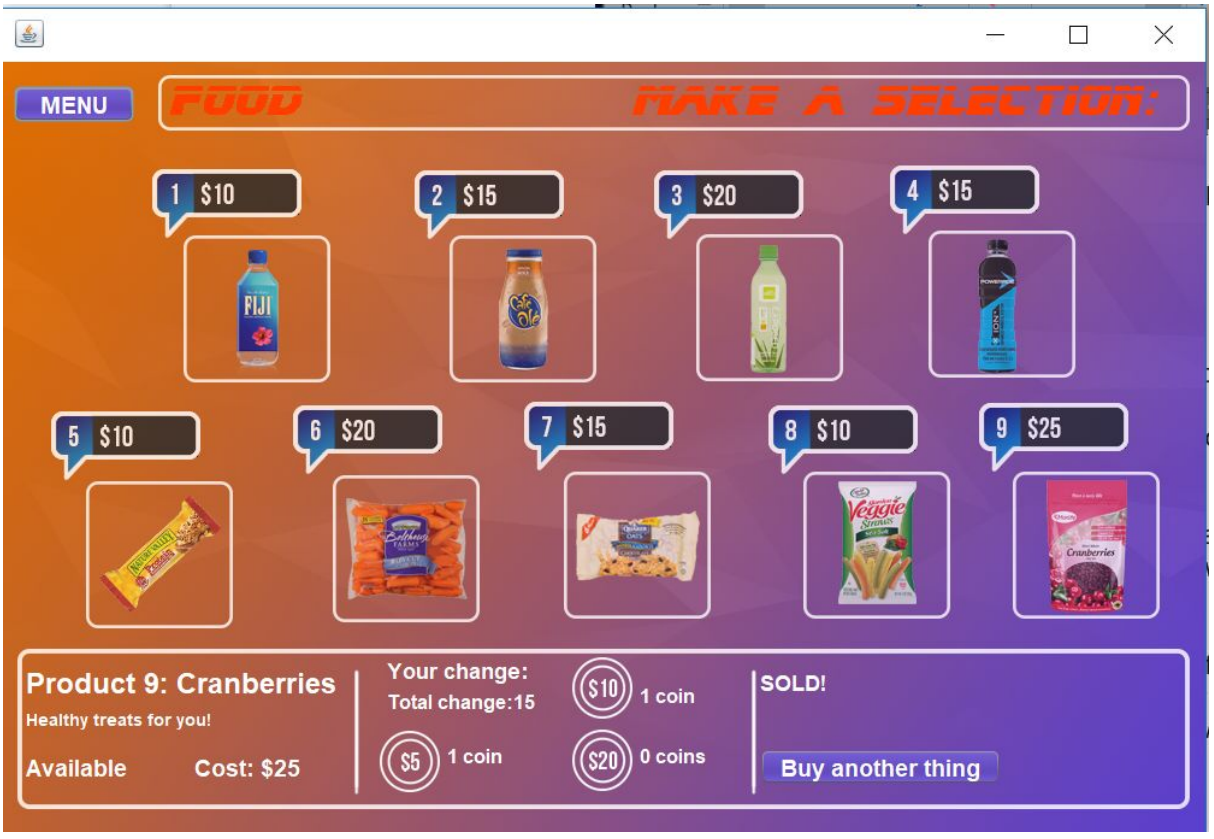
EVIDENCES



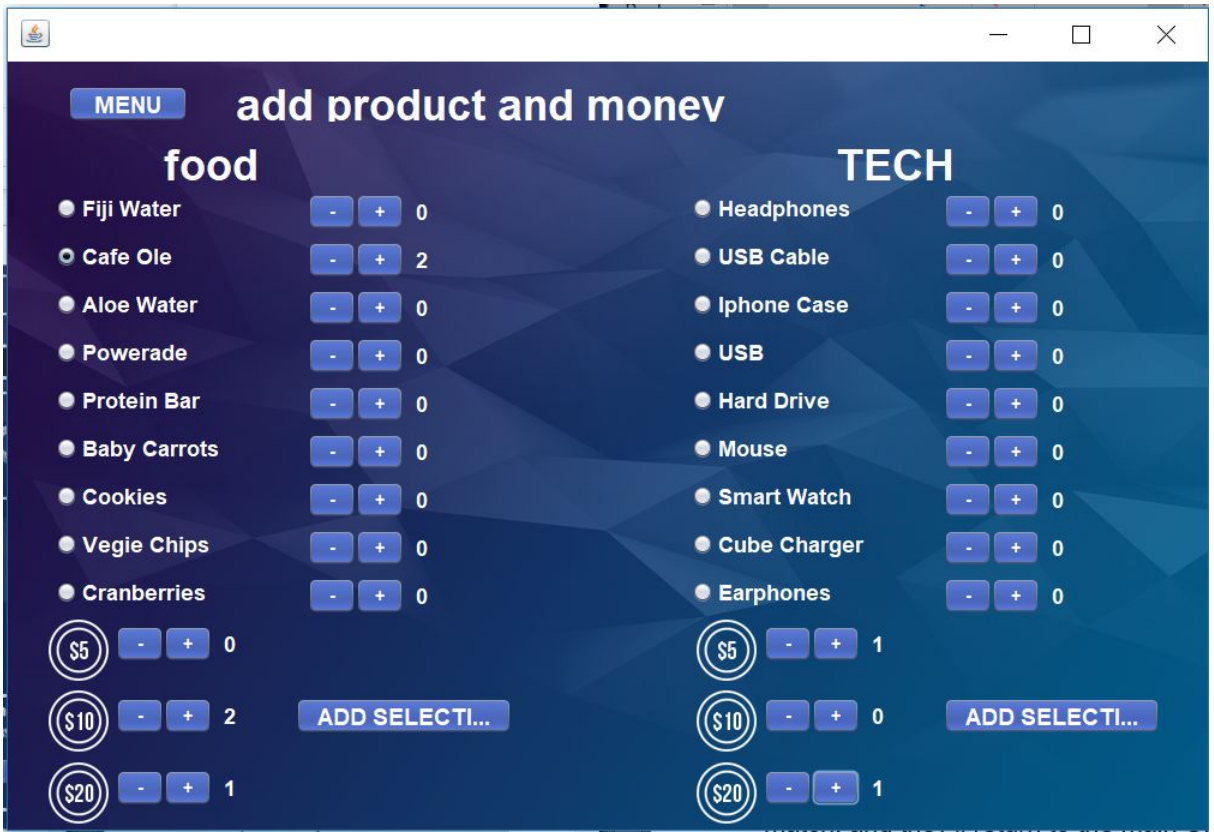

MENU
FOOD
MAKE A SELECTION:
1 $10
2 $15
3 $20
4 $15
5 $10
6 $20
7 $15
8 $10
9 $25


MENU
FOOD
MAKE A SELECTION:
1 $10
2 $15
3 $20
4 $15
5 $10
6 $20
7 $15
8 $10
9 $25
Product 6: Baby Carrots
Nutritious carrots!
Available
Cost: $20
Introduce money
Your funds: 250
$10
$5
$20
-
+
Total money introduced: 0
Introduce more money
Work


MENU
FOOD
MAKE A SELECTION:
1 $10
2 $15
3 $20
4 $15
5 $10
6 $20
7 $15
8 $10
9 $25
Product 9: Cranberries
Healthy treats for you!
Available
Cost: $25
Introduce money
Your funds: 210
$10
$5
$20
Total money introduced: 40
You can buy this!
Buy
Work


MENU
FOOD
MAKE A SELECTION:
1 $10
2 $15
3 $20
4 $15
5 $10
6 $20
7 $15
8 $10
9 $25
Product 9: Cranberries
Healthy treats for you!
Available
Cost: $25
Your change:
Total change:15
$10 1 coin
$5 1 coin
$20 0 coins
SOLD!
Buy another thing


MENU
TECH
MAKE A SELECTION:
1 $450
2 $100
3 $90
4 $120
5 $400
6 $300
7 $850
8 $50
9 $80
Product 7: Smart Watch
Keep being productive!
Available
Cost: $850
Introduce money
Your funds: 890
$10
$5
$20
Total money introduced: 0
Introduce more money
Work


MENU
add product and money
food
Fiji Water 0
Cafe Ole 2
Aloe Water 0
Powerade 0
Protein Bar 0
Baby Carrots 0
Cookies 0
Vegie Chips 0
Cranberries 0
$5 0
$10 2
$20 1
ADD SELECTI...
TECH
Headphones 0
USB Cable 0
Iphone Case 0
USB 0
Hard Drive 0
Mouse 0
Smart Watch 0
Cube Charger 0
Earphones 0
$5 1
$10 0
$20 1
ADD SELECTI...

TIME SPENT ON THE PROJECT

Daniel: 787 minutes
Hugo: 422 minutes
Roberto: 402 minutes

Total: 1611 minutes, 26 h 51 min