WORKSHOP #2 TECHNICAL REPORT

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User stories:

- As a customer, I want to be able to choose the material of the arcade machine, so what it adapts to my needs.
- As a customer, I want to have a list of available games, so what i can choose the one I want to play.
- As a customer I want to be able to add the games that I buy to the arcade machine, so what I can then play them later.
- As a customer, I want to finalize the purchase of the arcade machine, so what I can have access to it.
- As a customer, I want to be able to register my data, so what the machine is my property.

- As a customer, I want that the store has a merchandising section for the store, so what I can buy items that I like.
- As a customer, I want to know the price, name, year of manufacture of each machine, so what I can know if it meets my needs.
- As a customer, I want to select the color of the arcade machine I choose to purchase, so what it fits my needs.
- As a customer, I want to know how the price of my machine increases when changing its features, so what the price fits my capabilities.
- As a customer, I want to know how the price of my machine increases when adding video games, so what the total price fits my budget.
- As a CTO, I want the user to be able to see the machines available by price range, so what they can choose the machine that fits the amount of money they have.
- As a CTO, I want the user to be able to see the machines available by weight range, so what they can choose the machine they want.
- As a CTO, I want the user to be able to see the machines available by power consumption range so what they can choose the machine they want.
- As a CTO, I want to show users the games available for each machine, so what each user can select the games that can be included in the arcade machine they are going to purchase based on the game category.
- As CTO I want the price, weight and energy consumption of the machine to change when selecting a certain material, so what the sale of machines is lucrative.

Objected oriented principles and software patterns analysis:

Object-oriented paradigm application decisions:

Through the arcade machine, store, user and games classes, the implementation of encapsulation within the arcade store program can be seen, since the internal attributes of each class are stored within each class, showing the user those attributes that are desired.

Likewise, the use of abstraction is evident in each of the classes because the attributes and methods necessary for the implementation in the program were modeled, discarding those attributes that are not necessary for the implementation.

Polymorphism is evident in the child classes of the arcade machines, where they implement attributes of the main class (ArcadeMachine) and change the value of the attributes according to the type of machine.

Inheritance is evident in the specialized classes of the game and ArcadeMachine classes, because these classes inherit attributes and behaviors from their parent classes and at the same time add other specific attributes and behaviors.

Finally, in the main program file, objects such as the user, the arcade machine, and the games are instantiated, varying only in the content of their attributes, thus implementing object-oriented programming.

Decisions on the application of design patterns:

In the application, the factory pattern was implemented in the FactoryGame class, with the aim of adding games to the machine by simply interacting with the FactoryGame class, generating low coupling and high flexibility.

Again, the factory pattern was implemented in the FactoryMachine class, with which the Store can create specialized Machine objects without knowing the complete logic of the Machine child classes. In this way, the application is flexible to future modifications.

It was decided not to use the astrract factory pattern to prevent the application logic from becoming too complex, making subsequent modification difficult.

Likewise, a clear way to implement the builder pattern was not found, because with the factory pattern a better result was achieved for creating objects in a flexible way.

CRC Cards:

Store	
Responsability	Collaboration
Have all the products selled in the store, like arcade machines, games, and merchandising. Show all the products selled in the store. Add products to the store. Show the machines using restrictions	Arcade machine User

Arcade machine	
Responsability	Collaboration
Have the arcade machine attributes like, material, games, price, name and year of creation. Allow the addition of games. Show the attributes of the arcade machine. Modify the attributes from the machine.	Store Game

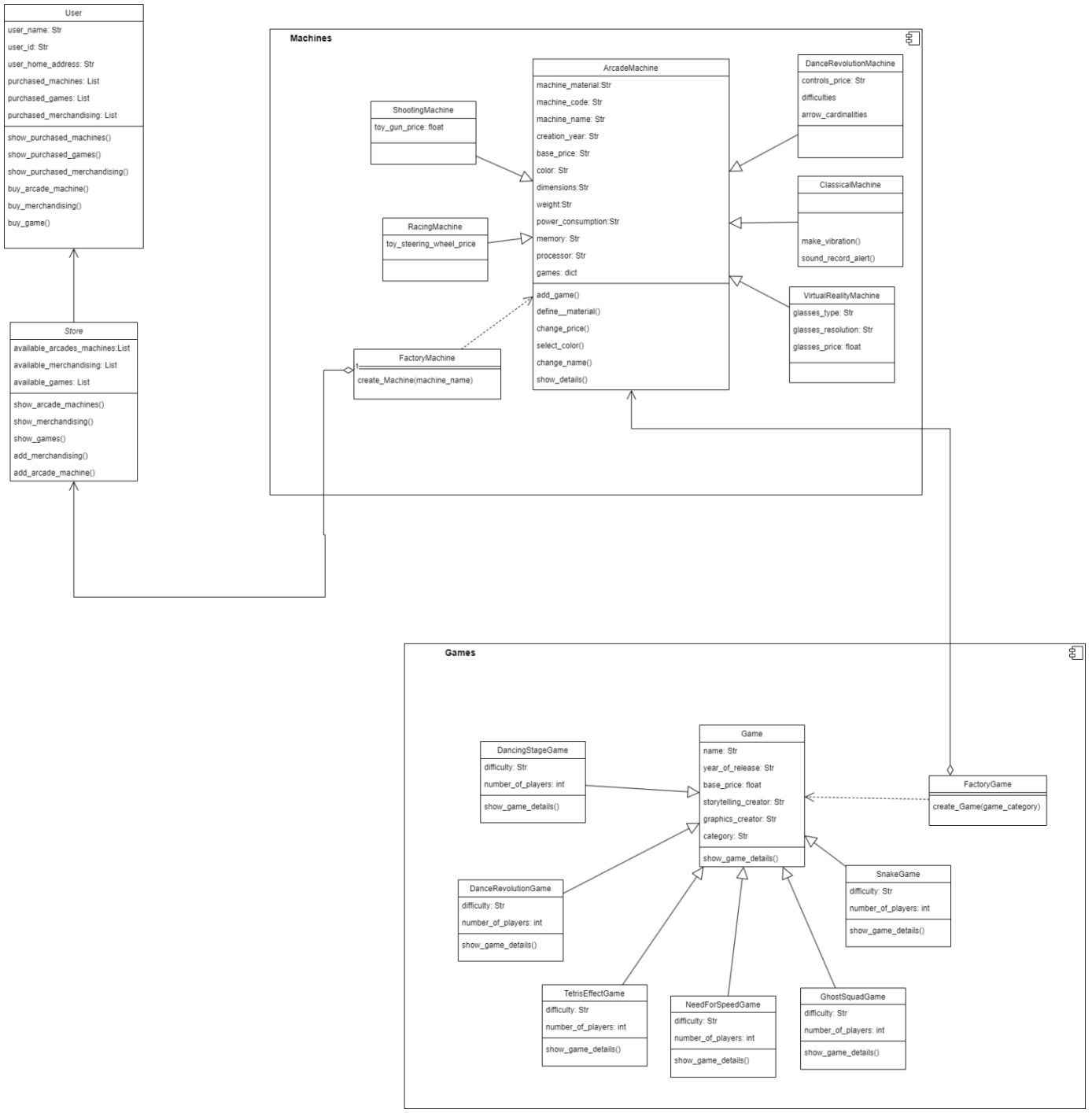
User	
Responsability	Collaboration
Have user information such as username, ID, home address, purchased machines, purchased games, and purchased merchandising. In the same way, buys arcade machines, games or merchandising, and also shows the products he has purchased.	Store

Game	
Responsability	Collaboration
Have the game information like name, year of release, and Price. In the same way, show the details from the game.	Arcade machine

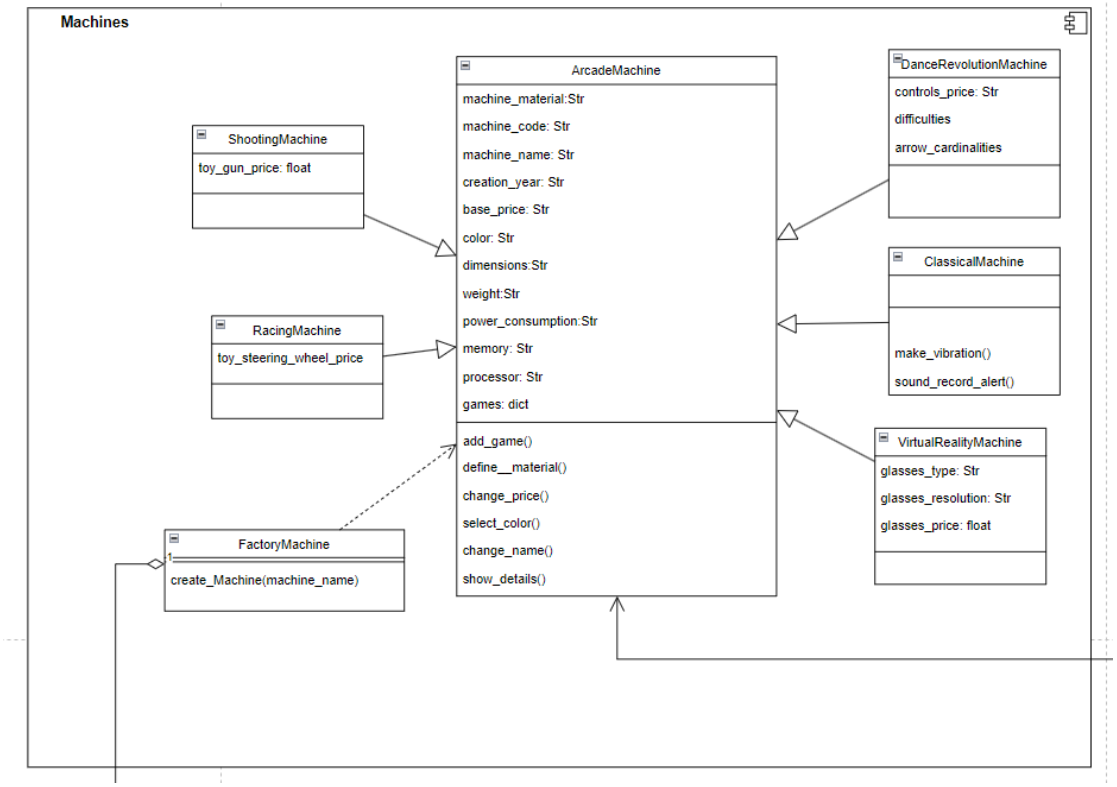
It was decided to omit the child classes of the Machine and Game classes, since the responsibilities of these classes are the same.

Class diagram:

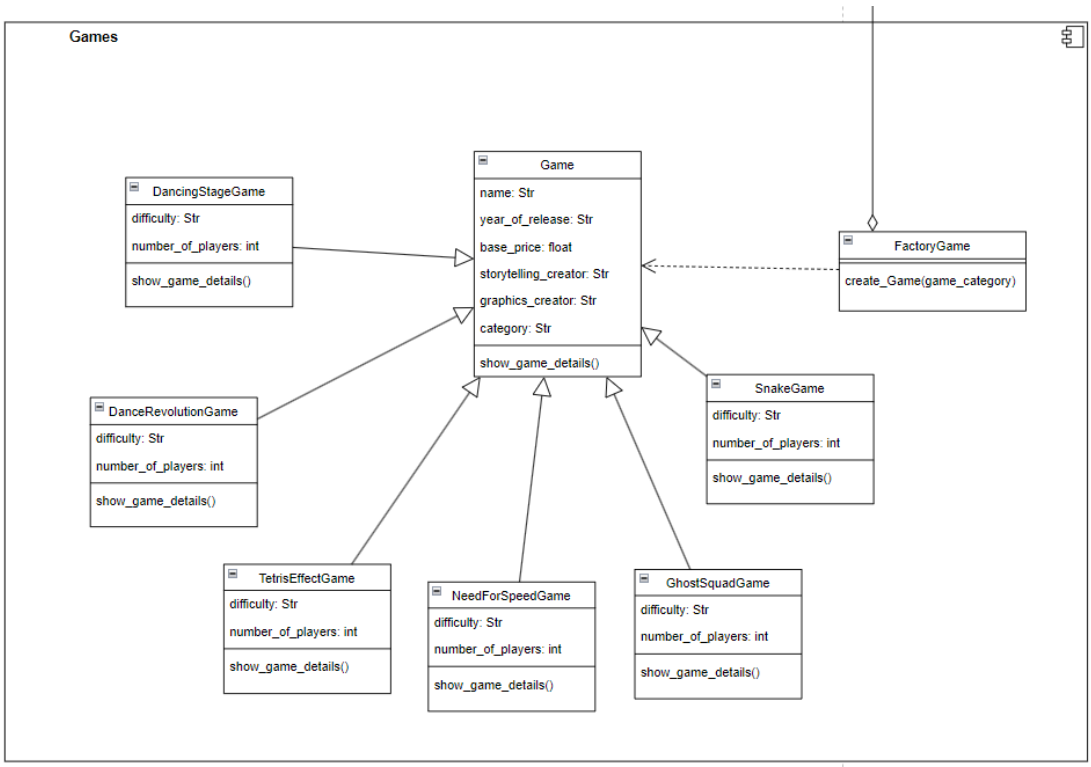
Complete class diagram



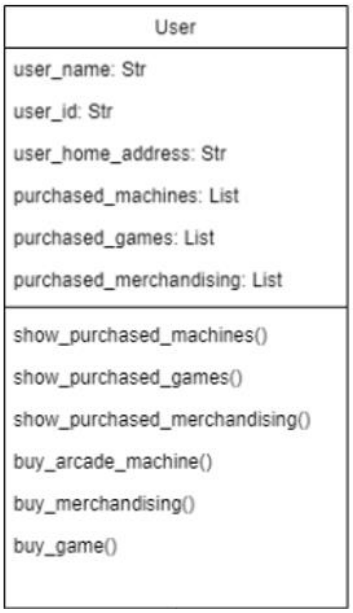
Machines component



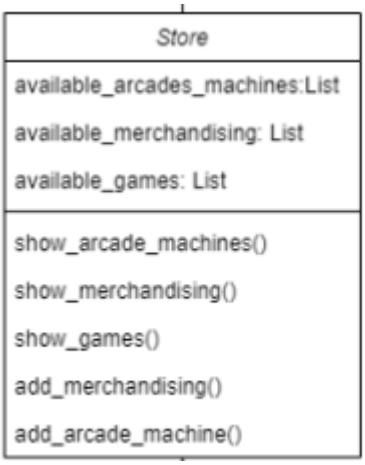
Games component



User class:



Store class:



This class diagram shows the User class, which contains the user identification attributes, as well as the methods for purchasing products in the store and viewing the purchased products.

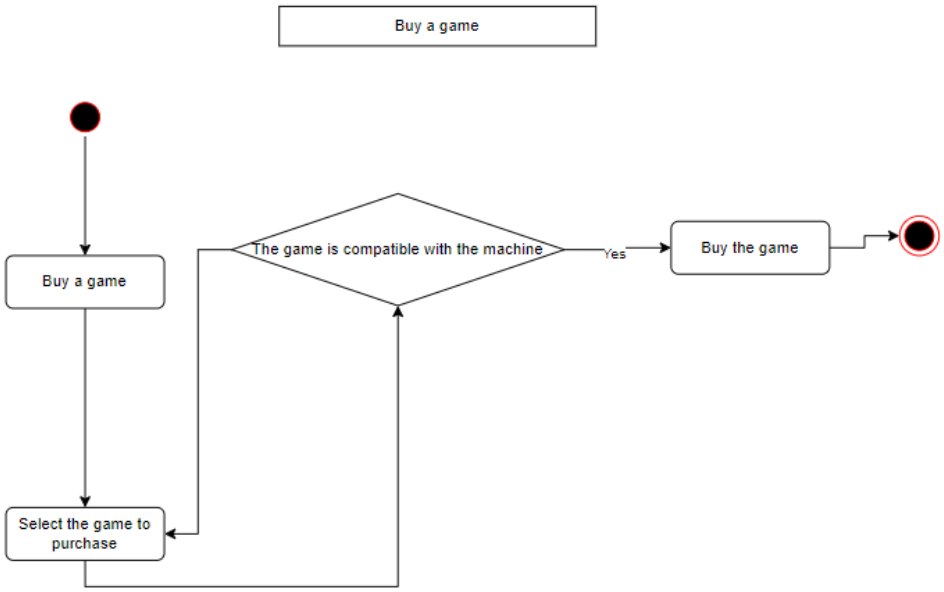
The Store class is also shown, which contains the lists of available products and the methods to display the products in the store and add products (arcade machines, games and merchandising) to the lists of available products.

The Machines component is also shown. This component has the Arcade Machine class, which includes all its identification attributes, as well as the methods to add games, define material, change the price, select the color, change the name, as well as view machine details. This component also contains the machine specializations with additional attributes and additional methods. This component also contains the FactoryMachine class, which is in charge of creating an arcade machine to add it to the store.

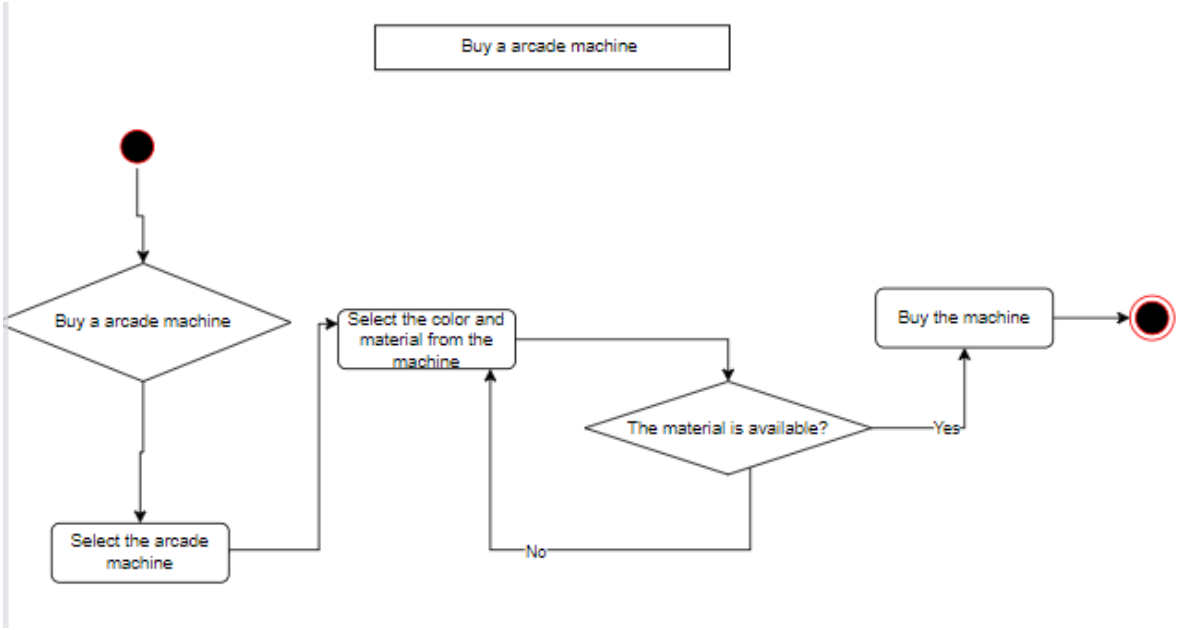
Finally, the Games component is shown, which includes the Game class, which has the attributes of name, release year, price, storytelling creator, graphics creator and category, as well as the method to view the game details. The Games component also includes the game specializations with additional attributes and the FactoryGame class, which is in charge of creating a game to add it to the machine.

Activity diagrams

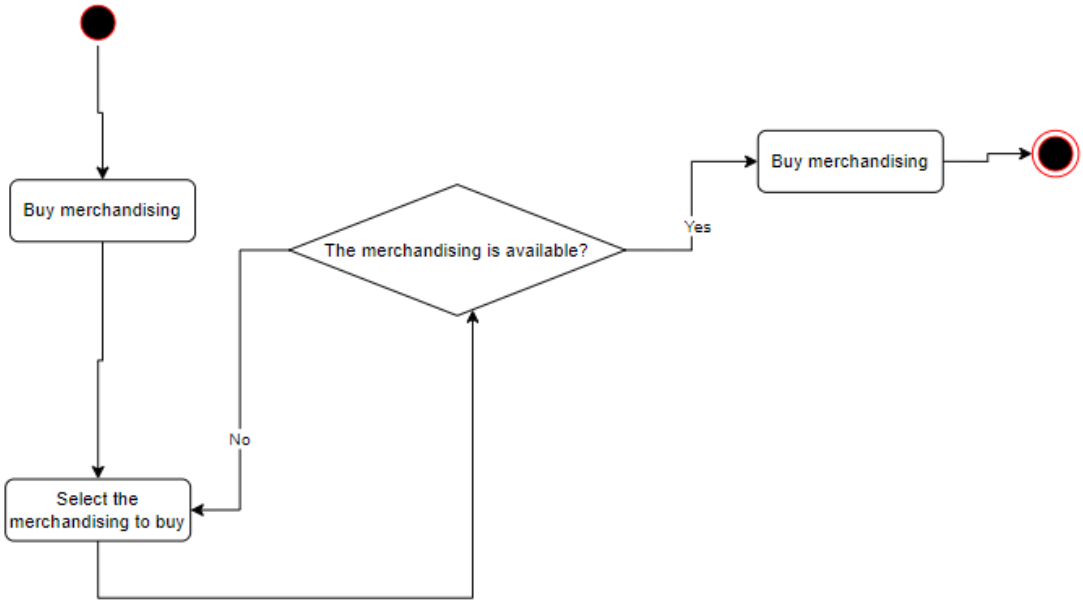
This diagram shows the process for purchasing a game, where the game to be purchased is selected, and if the game is compatible with the machine, the user buy the game.



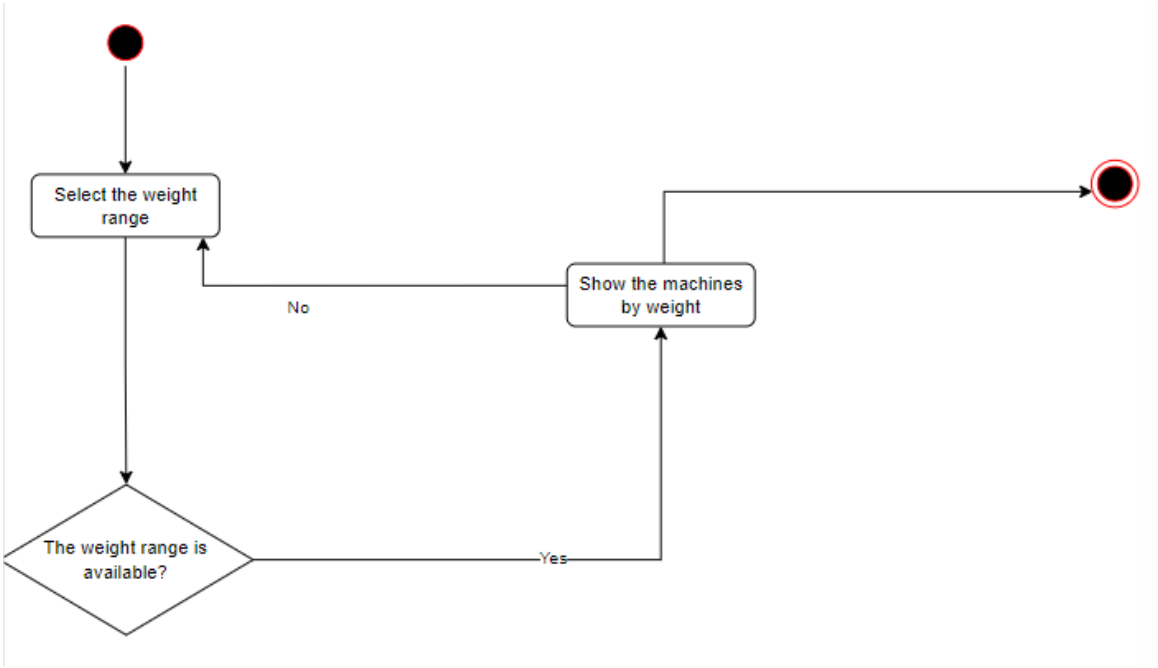
This diagram shows the process for purchasing a machine, where the machine to be purchased is selected, along with the color and material of the machine, if the material is available, the machine is purchased.



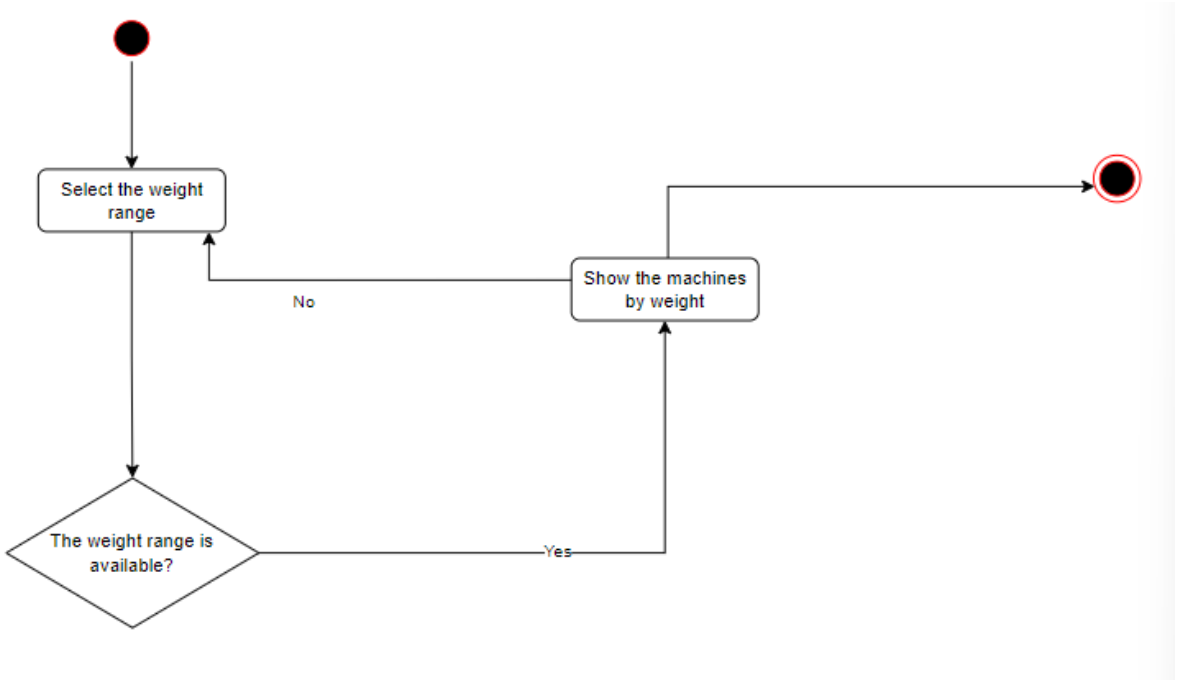
This diagram shows the process for purchasing merchandising, where the product to be purchased is selected and if the product is available, the user buy the product.



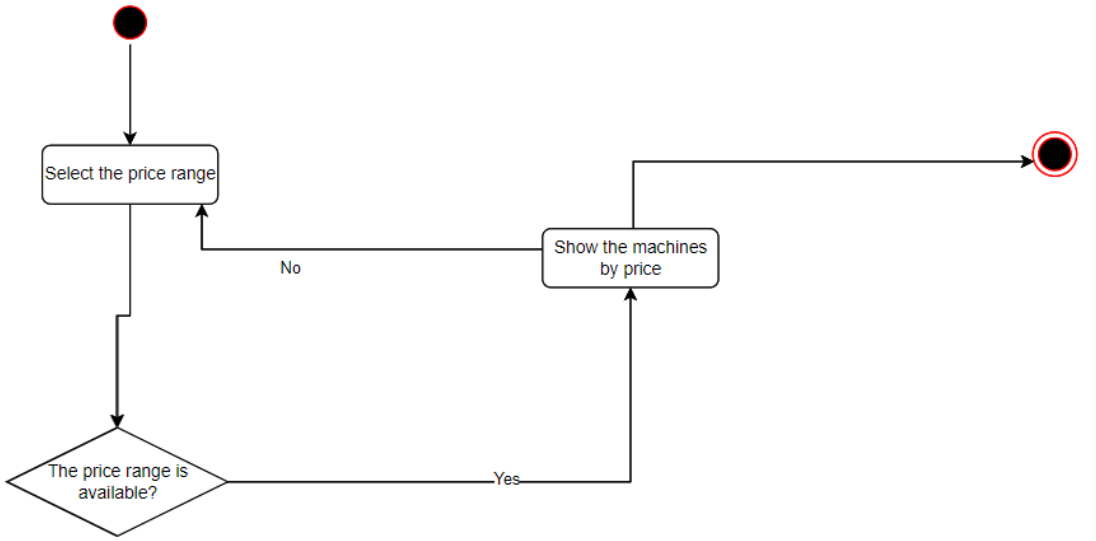
This diagram shows the process for displaying the arcade machines by the weight, where the user selects a weight range, and if this range is available, the System shows the user the machines that match with the range.



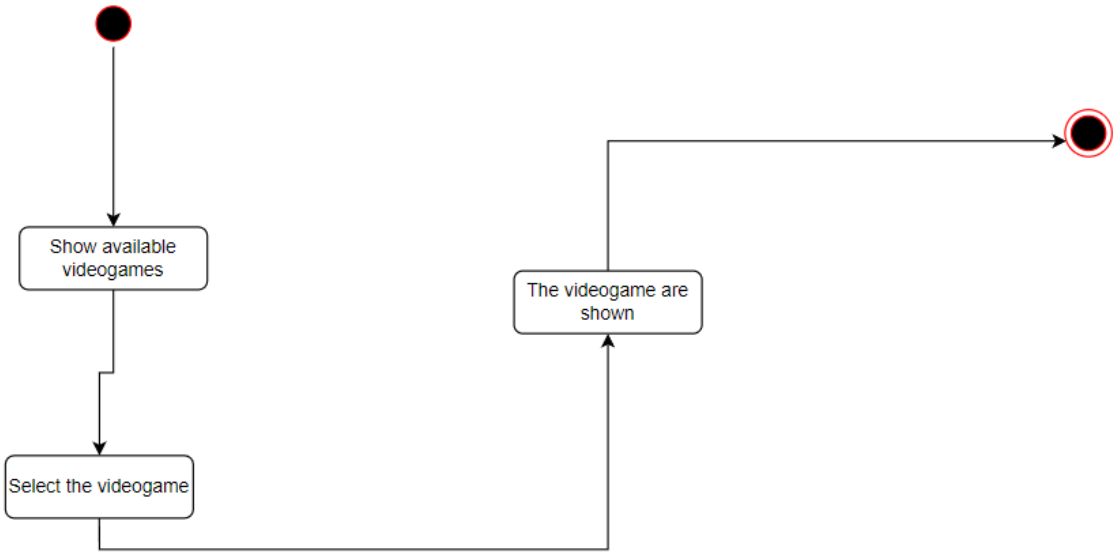
This diagram shows the process for displaying the arcade machines by the power consumption, where the user selects a power consumption range, and if this range is available, the System shows the user the machines that match with the range.



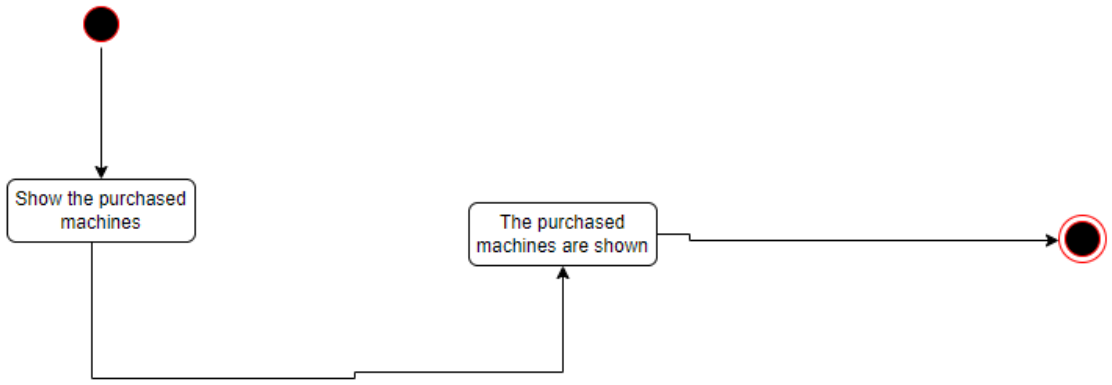
This diagram shows the process for displaying the arcade machines by the price, where the user selects a price range, and if this range is available, the System shows the user the machines that match with the range.



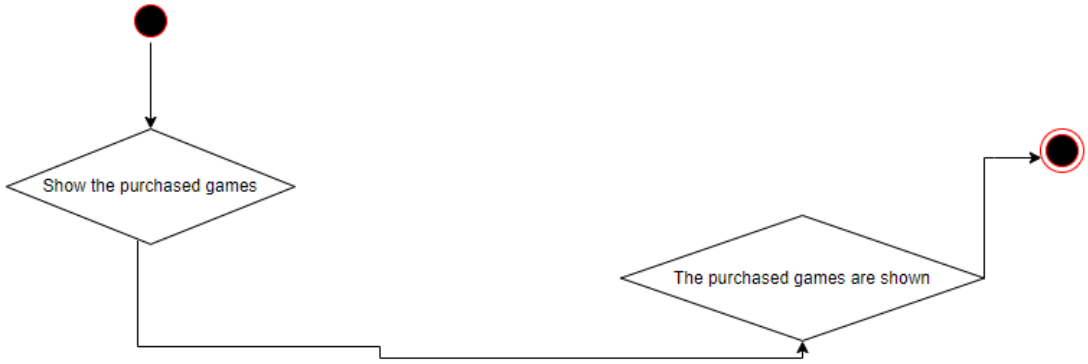
This diagram shows the process for displaying a video game, where after selecting the option “Show the availables games” and select the videogame, its attributes are displayed.



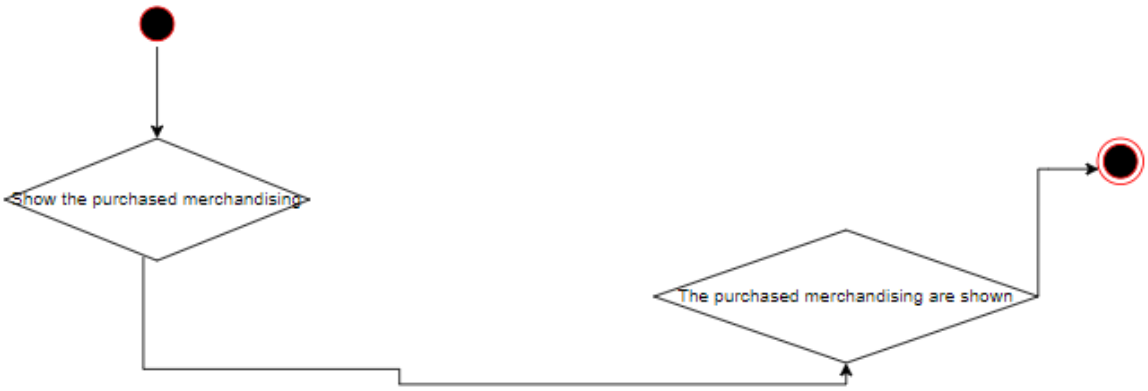
This diagram shows the process for displaying purchased arcade machines, where selecting the "Show the purchased machines" option displays the purchased machines.



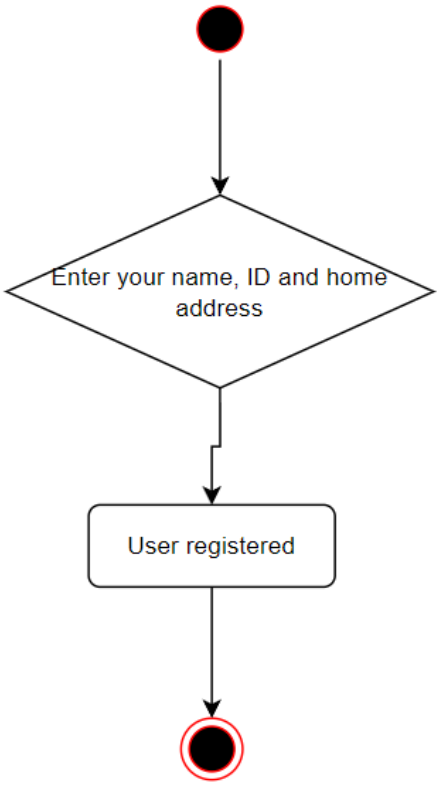
This diagram shows the process for displaying purchased games, where selecting the "Show the purchased games" option displays the purchased games.



This diagram shows the process for displaying purchased merchandising, where selecting the "Show the purchased merchandising" option displays the purchased products.

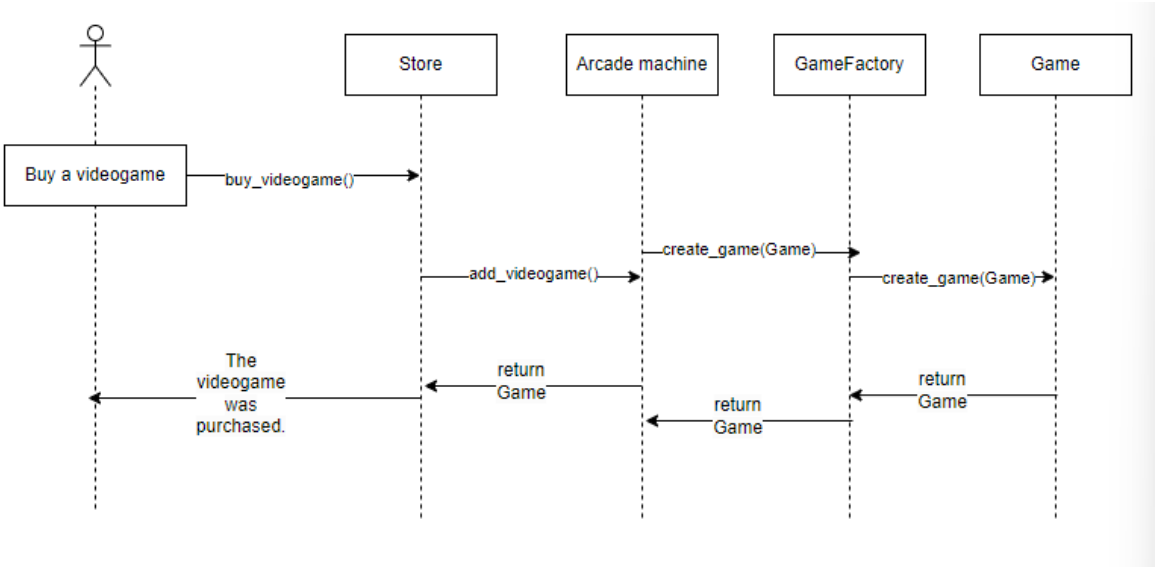


This diagram shows the process to register a user where after saving the name, id and home address, the user is registered.

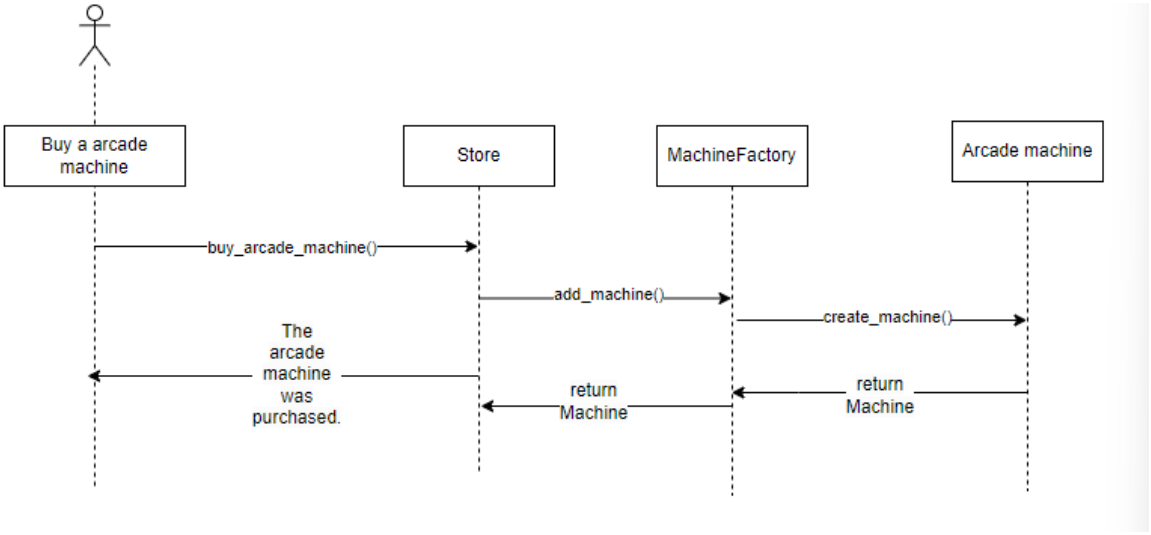


Sequence diagrams

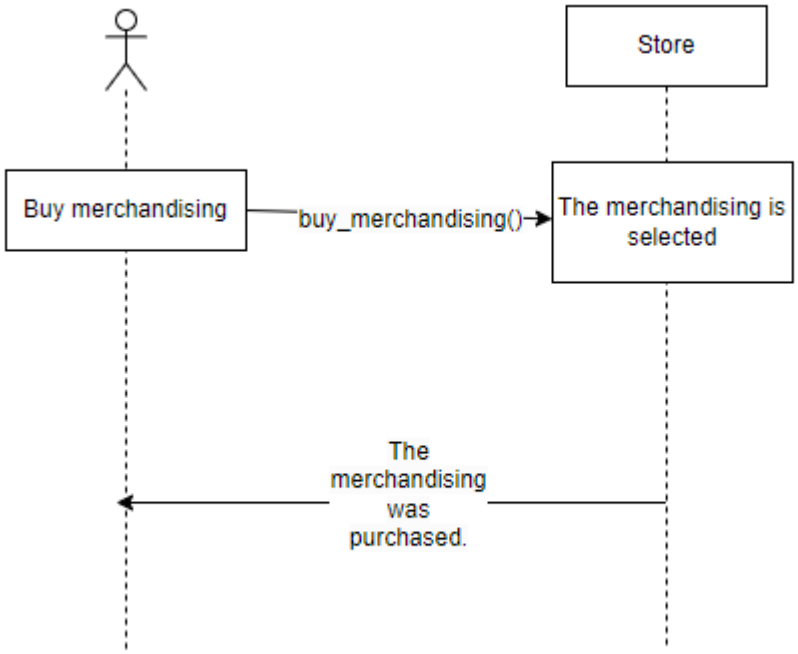
This diagram shows how when trying to buy a videogame this information is received in the application and the acceptance of the purchase is returned.



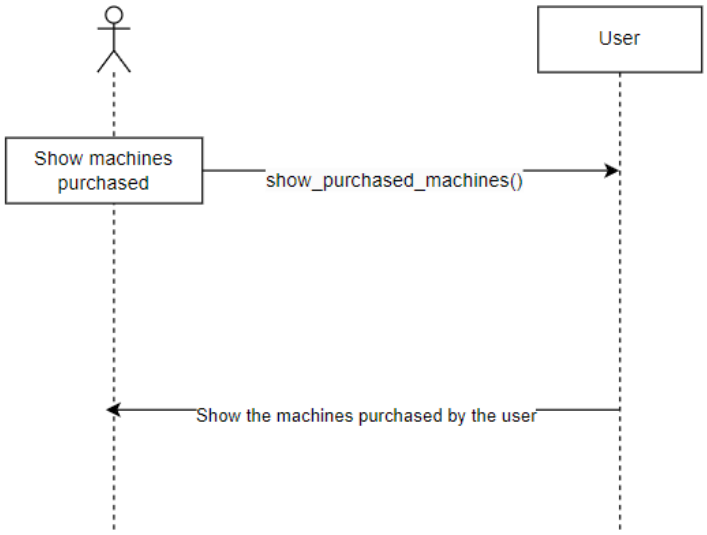
This diagram shows how when trying to buy a machine this information is received in the application and the acceptance of the purchase is returned.



This diagram shows how when trying to buy a merchandising this information is received in the application and the acceptance of the purchase is returned.



This diagram shows how the user can see the machines that he has bought.



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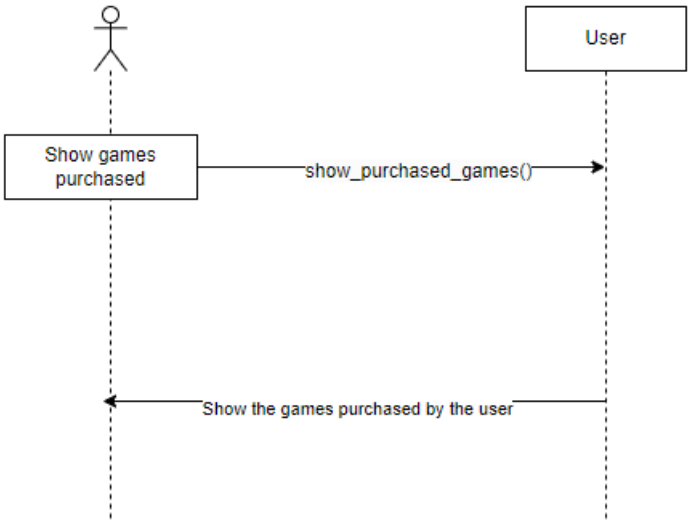
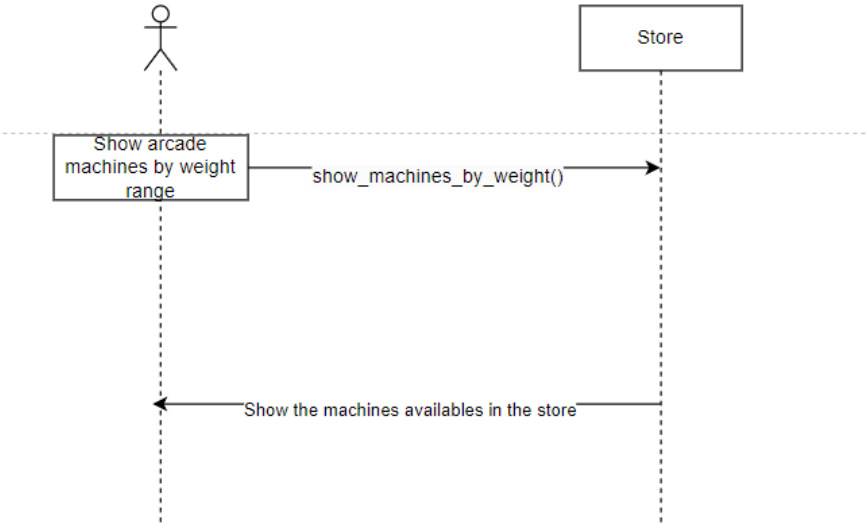
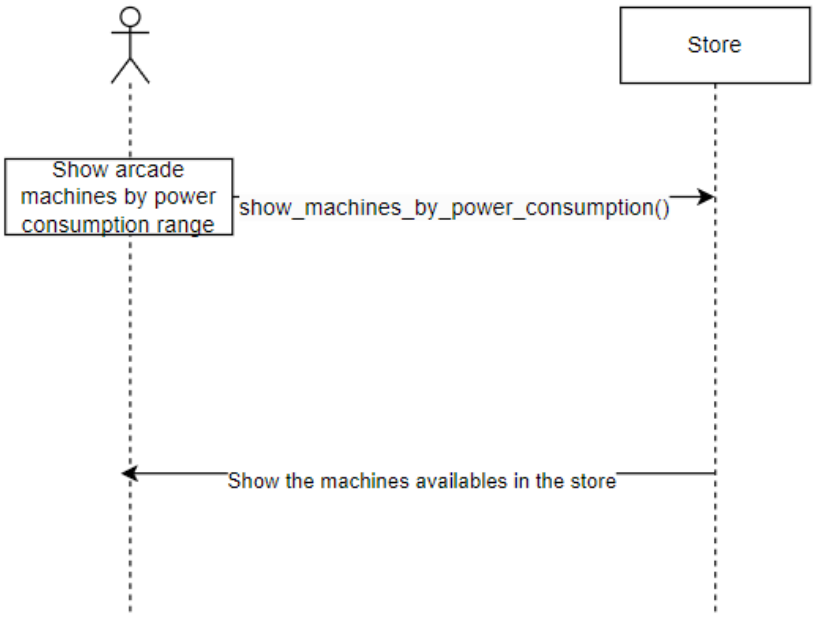


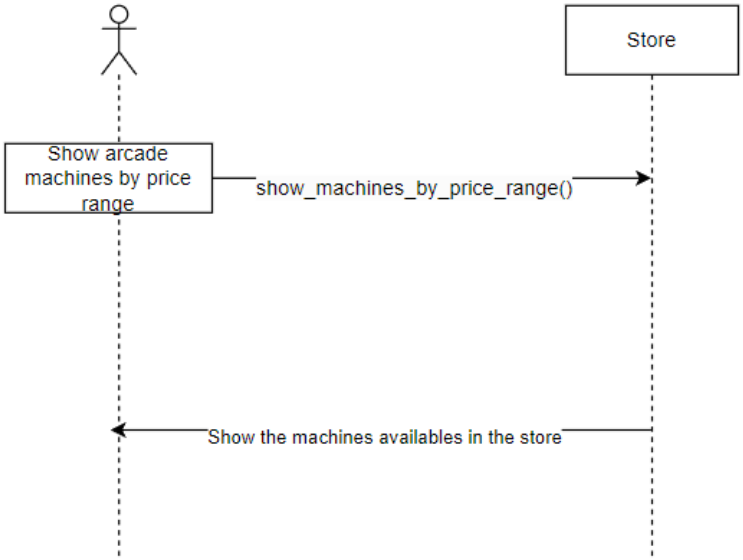
This diagram shows how the user can view arcade machines filtered by their weight.



This diagram shows how the user can view arcade machines filtered by their power consumption.



This diagram shows how the user can view arcade machines filtered by their price.



This diagram shows how the user can view the available arcade machines from the store.