

Software Modeling Workshop 1

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user stories:

1. As a retro gaming enthusiast, I want to choose between wood, aluminum, or carbon fiber for the arcade machine, so that I can have a machine that fits my aesthetic preferences.
2. As a gamer, I want to browse a catalog of available arcade games, so that I can choose the ones I like the most.
3. As a customer, I want to add additional games by entering a code, so that I can customize my arcade machine with new content.
4. As a tech-savvy buyer, I want to preview the hardware specifications of the machine, so that I know the performance capacity of my arcade setup.
5. As a parent, I want to enable a family-friendly mode, so that I can filter out violent games when my children are playing.
6. As a fan of classic arcade games, I want to see a dedicated section for retro games, so that I can easily find and select my favorite classics.
7. As a competitive player, I want to see leaderboards for high scores, so that I can track my progress and compete with friends.
8. As a buyer, I want to see customer reviews for different arcade machines, so that I can make an informed decision before purchasing.
9. As a game collector, I want to view limited-edition machines in the catalog, so that I can purchase rare or special designs.
10. As a casual gamer, I want to have pre-set game bundles available for purchase, so that I can save time selecting individual games.
11. As a arcade machine owner, I want to be able to order replacement parts through the platform, so that I can maintain my machine over time.
12. As a video game enthusiast, I want to customize the lighting of the arcade machine, so that it matches the ambiance of my game room.
13. As a buyer, I want to be able to save my favorite arcade games to a wishlist, so that I can purchase them later.
14. As a gamer, I want to be able to preview gameplay videos of each available game, so that I can decide if I want to buy it.
15. As a customer, I want to finalize my purchase easily and input my delivery information, so that I can receive my arcade machine without hassle.

Object-oriented principles analysis

In this project, we employed several fundamental object-oriented principles to design a system for managing arcade machines and related transactions. Encapsulation is evident in the way we structured our classes: AbstractMachine encapsulates the material property and provides an abstract method for setting the material, which is concretely implemented by ArcadeMachine. The Customer class encapsulates both the username and a private address, demonstrating data hiding. Abstraction is illustrated by the use of abstract methods in AbstractMachine and the abstract nature of the User class, which define essential behaviors without specifying their details until subclass implementation. Inheritance is used to extend User into Customer and AbstractMachine into ArcadeMachine, enabling the reuse of code and the extension of functionality. Polymorphism is shown through the select_material method in ArcadeMachine, which implements the abstract method defined in AbstractMachine, allowing different materials to be selected according to subclass definitions. Additionally, composition is employed by integrating the Catalog class with Game, where Catalog manages a list of Game objects and provides filtering capabilities. Finally, aggregation is reflected in Purchase, which uses the ArcadeMachine and Game instances to calculate the total purchase amount, demonstrating a collaborative approach to handling transactions. This design ensures a modular, flexible, and maintainable system, adhering to key object-oriented principles.

CRC Cards:

ArcadeMachine	
Responsibility	Collaborators
<ul style="list-style-type: none">Store machine material type	

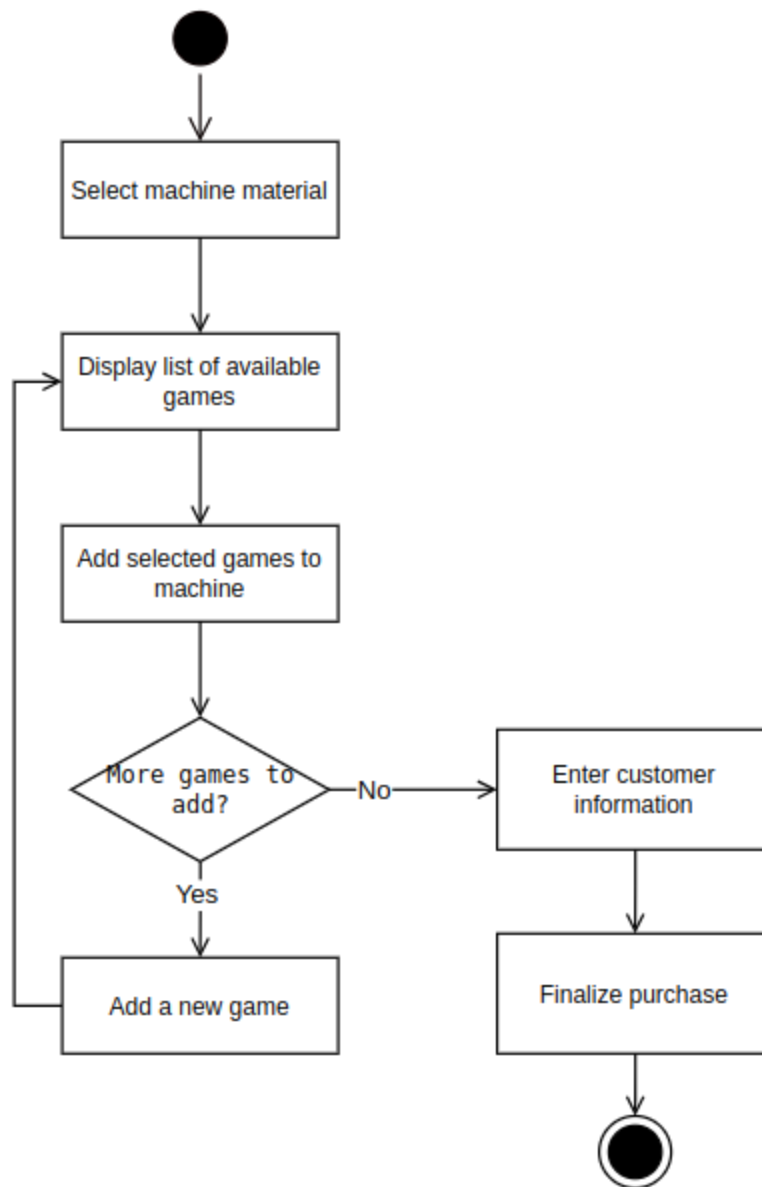
Game	
Responsibility	Collaborators
<ul style="list-style-type: none">Store game informationReturn game details	<ul style="list-style-type: none">ArcadeMachine

Customer	
Responsibility	Collaborators
<ul style="list-style-type: none">Store customer information (name, address)Provide delivery information	

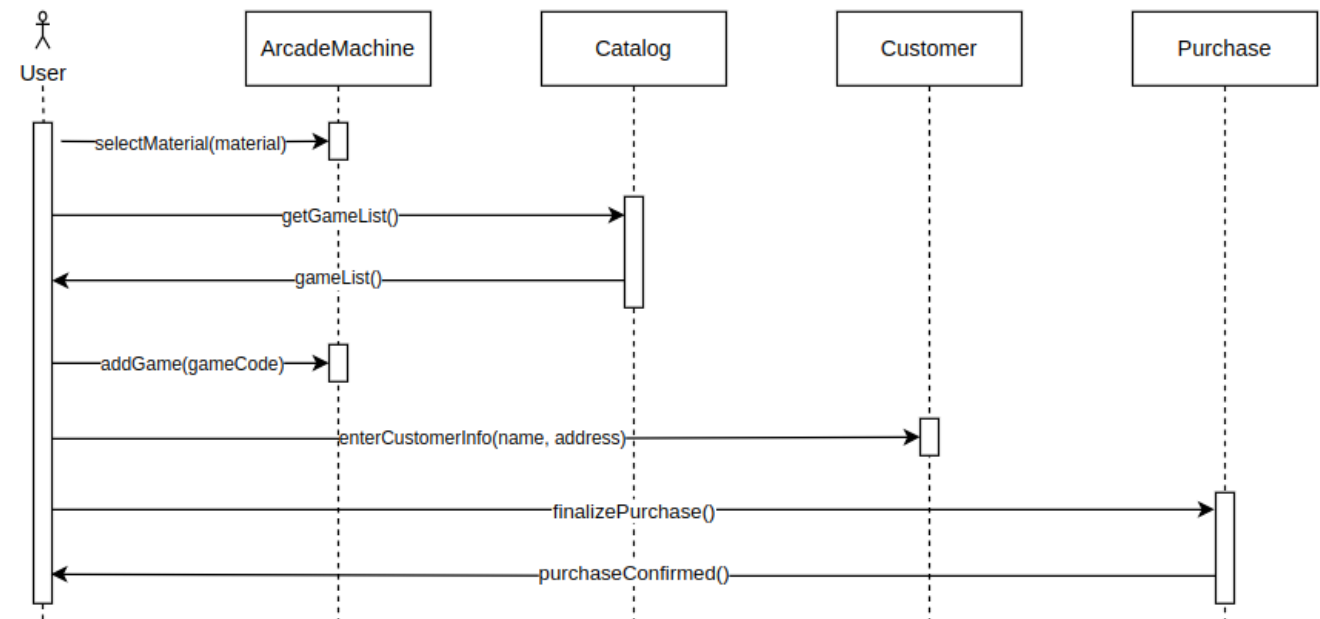
Catalog	
Responsibility	Collaborators
<ul style="list-style-type: none">Display available gamesFilter games by category	<ul style="list-style-type: none">Game

Purchase	
Responsibility	Collaborators
<ul style="list-style-type: none">Manage the checkout procesConfirm the purchase and generate a receipt	<ul style="list-style-type: none">CustomerArcadeMachine

Activity diagrams:



Sequence diagram:



Class diagram:

