Bike Rent, Repair and Purchase System (BIRRPS)

Swap, rent or get a new bike in minutes

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Statement of Work

INTRODUCTION:

This statement of work is prepared for the Bike Rent, Repair and Purchase system (BIRRPS) to be develop by Zainab Damilola Lawal and Tayfur Cem Acar for Ali Bike Services.

BACKGROUND:

We were going out to a park and decided to rent bikes from a bike shop we saw, Ali Bike Services. While renting the bikes, the owner of the shop, Ali, told us he has two stores, and it was hard to manage them. He struggles to attend to customers in the shops as it would be expensive to hire someone to watch over a shop while he watches over another. He also mentioned that he provides bike repair services and would like a way to integrate his services with a simple system without having to run around.

PROJECT PURPOSE:

The purpose of this project is to develop a software for a machine that will allow users purchase, rent or schedule/drop off their bikes for Ali to help him better serve his customers.

SCOPE OF WORK:

- To gather requirements for the software to be built.
- Design UML class and use case diagrams to show how the software would be structured.

- Building and testing a flexible software that fulfills Ali's requirements based on the created UML class and use case diagrams.

OUT OF SCOPE:

- Designing the hardware the software will run on.

Requirements

1. There should be a button to turn on the system
2. Users should be able to provide specifications of their desired bikes.
3. Information about each bike should be provided by the system.
4. Users should be able to swap bikes.
5. The system should be able to receive payments.
6. Different payments should be allowed.
7. System should ask users for their personal info to keep records.
8. The system should be able to make transaction contracts.
9. The system should ask the user about the part of their bikes that needs to be repaired.
10. Bikes to be repaired should be able to be picked up from the address provided.
11. The system should give the user a note with a code and the bike parking spot.
12. The system should go into sleeping mode after the user is done.

USE CASES WITH MATCHING REQUIREMENTS

USE CASE 1

1. The user comes to the system.	N/A
2. The user presses a button to start the system.	1
3. The system says, "Enter the specs of the bike you want to buy"	2
4. The user inputs the specs of the bike they want to buy.	2
5. The system shows information based on the specs given by the user.	3
6. The system asks the user, "Do you want to buy this bike?"	N/A
7. The user selects the YES button.	N/A
7.1 The user selects the NO button	N/A
7.2 The system returns to step 4.	N/A
8. The system asks, "Would like you to swap your old bike?"	4
9. The user chooses to swap their old bike.	4
9.1 The user selects the NO button.	N/A
9.2 The system skips to step 11.	N/A
10. The system asks, "How would you like to proceed with payment?"	5
11. The user proceeds with their credit card.	6

12.1 The user proceeds with cash.	6
12.2 The system opens a slot to accept the cash	5
12.3 The system skips to step 15.	N/A
12. The system asks, "Fill in the credit info"	6
13. The user fills in their credit card info.	6
14. The system asks for the user's personal info.	7
15. The user fills in their personal info.	7
16. The system prints out a copy of the contract.	8
17. The user signs the contract.	N/A
18. The system prints a note with the bike parking spot and access code	11
19. The system goes back to sleep	12

Conditions and Values for Case 1

START CONDITION: The user pushes the button to start the system

STOP CONDITION: The system goes back to sleep

CLEAR VALUE: The user can buy a bike without extra human interference.

EXTERNAL INITIATOR: The user

USE CASE 2

1. The user comes to the system.	N/A
2. The user presses a button to start the system.	1
3. The system says, "Enter the specs of the bike you want to rent"	2
4. The user inputs the specs of the bike they want to rent.	2
5. The system shows information based on the specs given by the user.	3
6. The system asks the user, "Do you want to rent this bike?"	N/A
7. The user selects the YES button.	N/A
7.1 The user selects the NO button	N/A
7.2 The system returns to step 4.	N/A
8. The system asks, "How would you like to proceed with payment?"	5
9. The user proceeds with their credit card.	6
9.1 The user proceeds with cash.	6
9.2 The system opens a slot to accept the cash	5
9.3 The system skips to step 15.	N/A
10. The system asks, "Fill in the credit info"	6
11. The user fills in their credit card info.	6
12. The system asks for the user's personal info.	7

13.	The user fills in their personal info.	7
14.	The system prints out a copy of the contract.	8
15.	The user signs the contract.	N/A
16.	The system prints a note with the bike parking spot and access code	11
17.	The system goes back to sleep	12

Conditions and Values for Case 2

START CONDITION: The user pushes the button to start the system

STOP CONDITION: The system goes back to sleep

CLEAR VALUE: The user can rent a bike without extra human interference.

EXTERNAL INITIATOR: The user

USE CASE 3

1. The user comes to the system.	N/A
2. The user presses a button to start the system.	1
3. The system says, "Enter the specs of the bike you want to repair"	2
4. The user inputs the specs of the bike they want to repair.	2
5. The system asks the user, "What part of the bike do you want to repair?"	9
6. The user selects the part needing repair from the options shown	9
7. The system asks the user, "Please enter the location of the bike for pickup"	10
8. The user enters the address of the bike	10
9. The system asks, "How would you like to proceed with payment?"	5
10. The user proceeds with their credit card.	6
10.1 The user proceeds with cash.	6
10.2 The system opens a slot to accept the cash	5
10.3 The system skips to step 15.	N/A
11. The system asks, "Fill in the credit info"	6
12. The user fills in their credit card info.	6
13. The system asks for the user's personal info.	7

14.	The user fills in their personal info.	7
15.	The system prints out a copy of the contract.	8
16.	The user signs the contract.	N/A
17.	The system goes back to sleep	12

Conditions and Values for Case 3

START CONDITION: The user pushes the button to start the system

STOP CONDITION: The system goes back to sleep

CLEAR VALUE: The user can give their bike for repair without extra human interference.

EXTERNAL INITIATOR: The user

Word Analysis

KEY: ***Noun*** ***Verb***

1. The user comes to the system.
2. The user presses a button to start the system.
3. The system says, "Enter the specs of the bike you want to buy"
4. The user inputs the specs of the bike they want to buy.
5. The system shows information based on the specs given by the user.
6. The system asks the user, "Do you want to buy this bike?"
7. The user selects the YES button.

    7.1 The user selects the NO button

    7.2 The system returns to step 4.

8. The system asks, "Would like you to swap your old bike?"
9. The user chooses to swap their old bike.

    9.1 The user selects the NO button.

    9.2 The system skips to step 11.

10. The system shows the trading conditions.
11. The system asks, "How would you like to proceed with payment?"
12. The user proceeds with their credit card.

    12.1 The user proceeds with cash.

    12.2 The system opens a slot to accept the cash.

    12.3 The system skips to step 15.

13. The system asks, "Fill in the credit info"

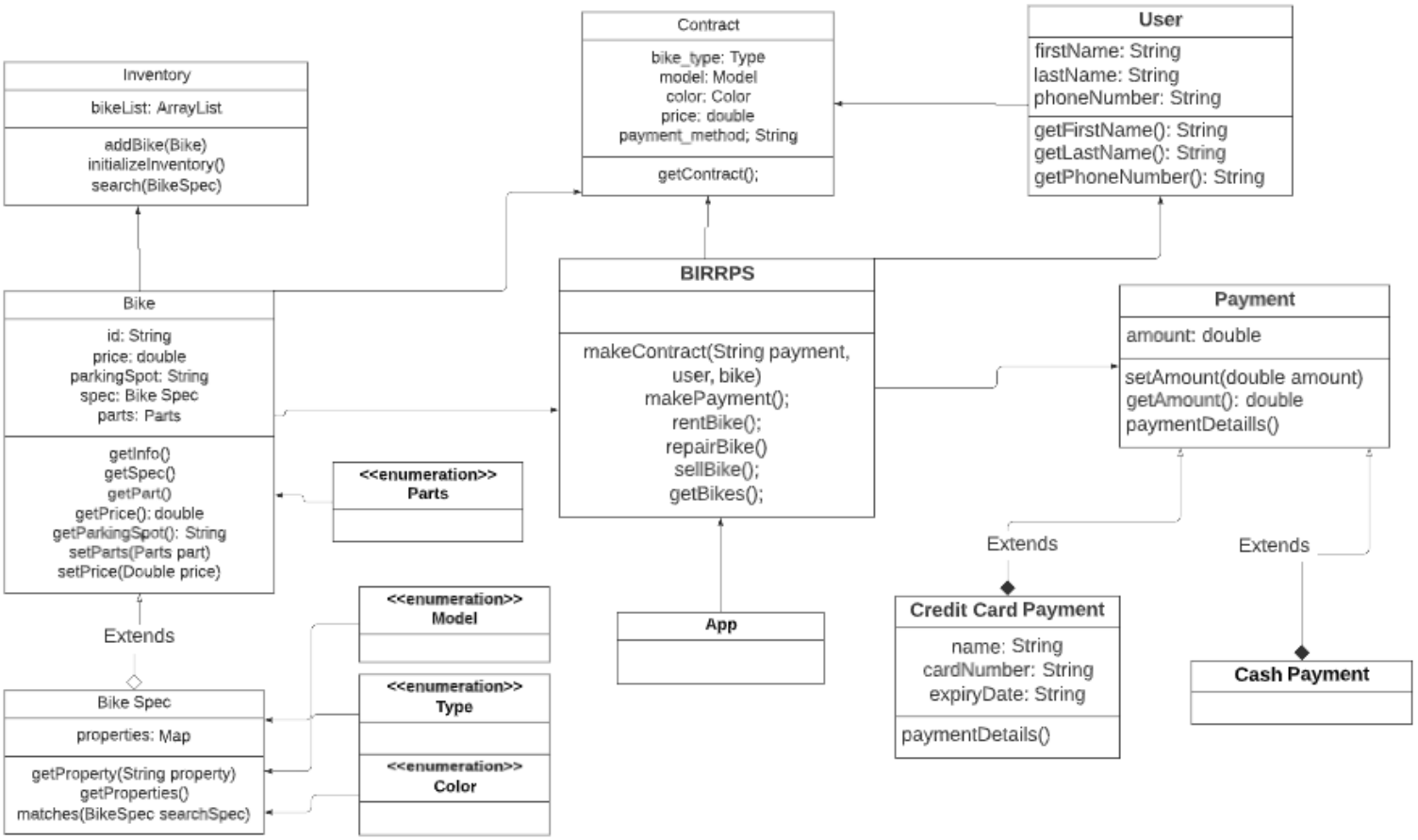
14. The user fills in their credit card info.
15. The system asks for the user's personal info.
16. The user fills in their personal info.
17. The system prints out a copy of the contract.
18. The user signs the contract.
19. The system prints a note with the bike parking spot and access code.
20. The system goes back to sleep.

Noun Analysis		Verb Analysis	
Candidate	Class?	Candidate	Method?
User	yes	**Comes**	no
System	yes	**Presses**	no
Bike	yes	**Says**	no
Contract	yes	**Enter**	no
Trading Conditions	yes	**Input**	no
Note	no	**Shows**	yes
Access code	no	**Ask**	no
Parking spot	no	**Selects**	no
Credit Card info	no	**Returns**	no

Personal info	no	Swap	no
Payment	yes	Chooses	no
Credit Card	yes	Skips	no
Cash	yes	Proceeds	no
Old bike	no	Opens	no
Button	no	Fills	no
Bike Specs	yes	Prints	yes
Information	no	Signs	no

Use Case Diaaram

UML Design


Contract
bike_type: Type
model: Model
color: Color
price: double
payment_method; String
getContract();
User
firstName: String
lastName: String
phoneNumber: String
getFirstName(): String
getLastName(): String
getPhoneNumber(): String
Inventory
bikeList: ArrayList
addBike(Bike)
initializeInventory()
search(BikeSpec)
BIRRPS
makeContract(String payment, user, bike)
makePayment();
rentBike();
repairBike()
sellBike();
getBikes();
Payment
amount: double
setAmount(double amount)
getAmount(): double
paymentDetaills()
Bike
id: String
price: double
parkingSpot: String
spec: Bike Spec
parts: Parts
getInfo()
getSpec()
getPart()
getPrice(): double
getParkingSpot(): String
setParts(Parts part)
setPrice(Double price)
<<enumeration>>
Parts
<<enumeration>>
Model
<<enumeration>>
Type
<<enumeration>>
Color
Extends
Bike Spec
properties: Map
getProperty(String property)
getProperties()
matches(BikeSpec searchSpec)
App
Extends
Extends
Credit Card Payment
name: String
cardNumber: String
expiryDate: String
paymentDetails()
Cash Payment