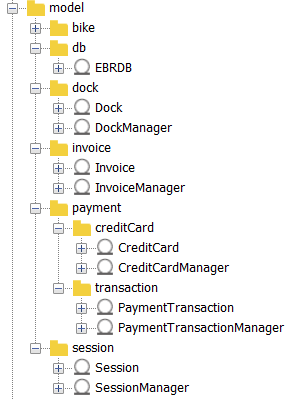
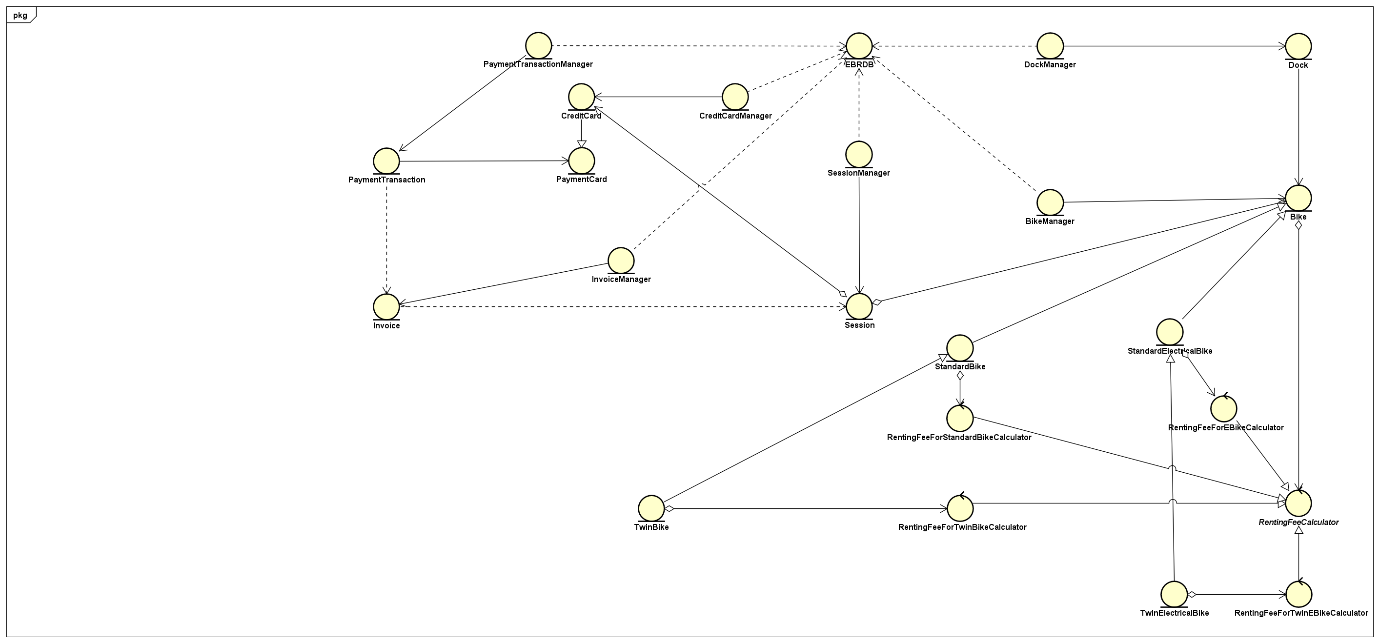
Class Design - Model

# Create Initial Design Classes

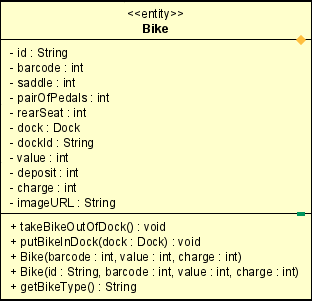


# Define Relationships Between Classes



# Class Design

## Class “Bike”



**Attribute**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| # | Name | Data type | Default value | Description |
| 1 | id | String | NULL | Bike id |
| 2 | barcode | int | NULL | barcode |
| 3 | saddle | int | NULL | saddle |
| 4 | pairOfPedals | int | NULL | Pair of pedals |
| 5 | rearSeat | int | NULL | Number of rear seats |
| 6 | dock | Dock | NULL | dock |
| 7 | dockId | String | NULL | Dock id |
| 8 | value | int | NULL | value |
| 9 | doposit | int | NULL | deposit |
| 10 | charge | int | NULL | charge |
| 11 | imageURL | String | NULL | Image URL |

**Operation**

|  |  |  |  |
| --- | --- | --- | --- |
| # | Name | Return type | Desciption |
| 1 | takeBikeOutOfDock | void | Take bike out of dock |
| 2 | putBikeInDock | void | Put bike to a dock |
| 3 | getBikeType | String | Get bike type |

**Parameter:**

* putBikeInDock
  + dock - Dock

**Exception:**

None

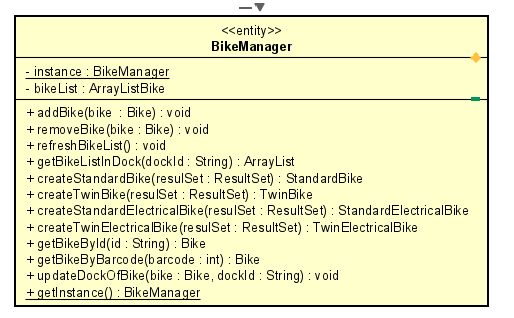
**Method**

None

**State**

None

## Class “BikeManager”



**Attribute**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| # | Name | Data type | Default value | Description |
| 1 | instance | BikeManager | NULL | Bike instance |
| 2 | bikeList | ArrayList | NULL | Bike list |

**Operation**

|  |  |  |  |
| --- | --- | --- | --- |
| # | Name | Return type | Desciption |
| 1 | addBike | void | Add bike |
| 2 | removeBike | void | Remove bike |
| 3 | refreshBikeList | void | Refresh bike list |
| 4 | getBikeListInDock | ArrayList | Get bike list in dock |
| 5 | createStandardBike | StandardBike | Create standard bike |
| 6 | createTwinBike | TwinBike | Create twin bike |
| 7 | createStandardEBike | StandardEBike | Create standard e bike |
| 8 | createTwinEBike | TwinEBike | Create twin e bike |
| 9 | getBikeById | Bike | Get bike by id |
| 10 | getBikeByBarcode | Bike | Get bike by barcode |
| 11 | updateDockOfBike | void | Update dock |
| 12 | getInstance | BikeManager | Get bike instance |

**Parameter:**

* addBike
  + bike - Bike
* getBikeListInDock
  + dockId - String
* createStandardBike
  + resultSet - ResultSet
* createTwinBike
  + resultSet - ResultSet
* createTwinEBike
  + resultSet - ResultSet
* getBikeById
  + id – String
* getBikeByBarcode
  + barcode - int
* updateDockOfBike
  + dockId – String
  + bike - Bike

**Exception:**

None

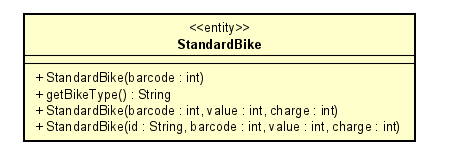
**Method**

None

**State**

None

## Class “StandardBike”



**Attribute**

None

**Operation**

|  |  |  |  |
| --- | --- | --- | --- |
| # | Name | Return type | Desciption |
| 1 | getBikeType | String | Get bike type |

**Parameter:**

None

**Exception:**

None

**Method**

None

**State**

None

## Class “StandardElectricalBike”

Table

Description automatically generated

**Attribute**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| # | Name | Data type | Default value | Description |
| 1 | battery | float | 100.0 | battery remained |
| 2 | timeRemain | Time | NULL | usage time base on battery and bike |

**Operation**

|  |  |  |  |
| --- | --- | --- | --- |
| # | Name | Return type | Desciption |
| 1 | getBikeType | String | Get bike type |

**Parameter:**

None

**Exception:**

None

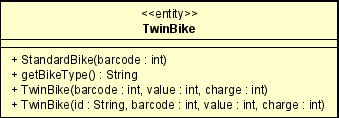
**Method**

None

**State**

None

## Class “TwinBike”



**Attribute**

None

**Operation**

|  |  |  |  |
| --- | --- | --- | --- |
| # | Name | Return type | Desciption |
| 1 | getBikeType | String | Get bike type |

**Parameter:**

None

**Exception:**

None

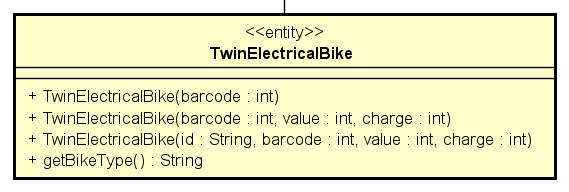
**Method**

None

**State**

None

## Class “TwinElectricalBike”



**Attribute**

None

**Operation**

|  |  |  |  |
| --- | --- | --- | --- |
| # | Name | Return type | Desciption |
| 1 | getBikeType | String | Get bike type |

**Parameter:**

None

**Exception:**

None

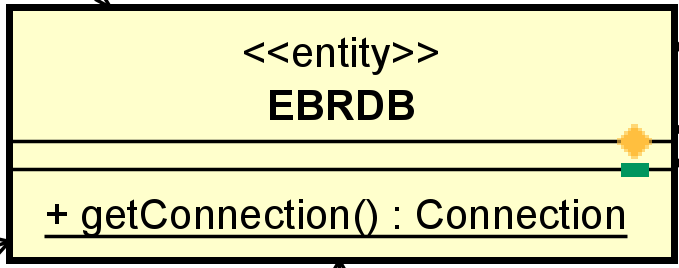
**Method**

None

**State**

None

## Class “EBRDB”



**Attribute**

None

**Operation**

|  |  |  |  |
| --- | --- | --- | --- |
| # | Name | Return type | Desciption |
| 1 | getConnection | Connect | get a connection to PostgreSQL database |

**Parameter:**

None

**Exception:**

None

**Method**

None

**State**

None

## Class “Dock”

Text

Description automatically generated

**Attribute**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| # | Name | Data type | Default value | Description |
| 1 | id | String | NULL | Dock id |
| 2 | name | String | NULL | Name of dock |
| 3 | location | String | NULL | Dock location |
| 4 | capacity | int | NULL | Dock size |
| 5 | imageURL | String | NULL | Dock image |
| 6 | bikeList | ArrayList<Bike> | NULL | Bike list in dock |
| 7 | createAt | Time | NULL | Time Create Dock |
| 8 | Availalbity | Int | NULL | Number of availability bike |

**Operation**

|  |  |  |  |
| --- | --- | --- | --- |
| # | Name | Return type | Desciption |
| 1 | addBike | void | Add bike to dock |
| 2 | removeBike | void | Remove bike out of dock |
| 3 | clearBikeList | void | Clear bike list in dock |
| 4 | addListOfBike | void | Add bike list to dock |

**Parameter:**

* addBike
  + bike – Bike
* removeBike
  + bike – Bike

**Exception:**

None

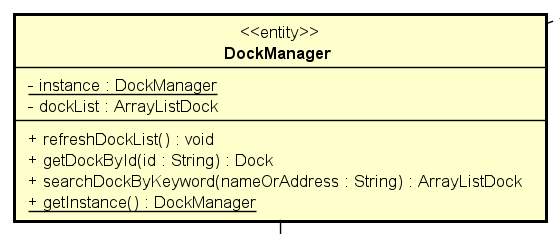
**Method**

None

**State**

None

## Class “DockManager”



**Attribute**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| # | Name | Data type | Default value | Description |
| 1 | instance | DockManager | NULL | Instance of a dock |
| 2 | dockList | ArrayList<Dock> | NULL | Dock list |

**Operation**

|  |  |  |  |
| --- | --- | --- | --- |
| # | Name | Return type | Desciption |
| 1 | refreshDockList | void | Refresh dock list |
| 2 | getDockById | Dock | Get dock by id |
| 3 | searchDockByKeyword | ArrayList<Dock> | Get docks by keyword |
| 4 | getInstance | DockManager | Get dock instance |

**Parameter:**

* getDockById
  + id - String
* searchDockByKeyWord
  + nameOrAddress - String

**Exception:**

None

**Method**

None

**State**

None

## Class “Invoice”

Table

Description automatically generated

**Attribute**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| # | Name | Data type | Default value | Description |
| 1 | id | String | NULL | Invoice id |
| 2 | sessionId | String | NULL | Session id |
| 3 | createAt | Time | NULL | Create time |
| 4 | type | String | NULL | Session corresponds to invoice |
| 5 | totalCharge | int | NULL | Total Charge |

**Operation**

|  |  |  |  |
| --- | --- | --- | --- |
| # | Name | Return type | Desciption |
| 1 | getDeposit | int | Get deposit |
| 2 | getCard | CreditCard | Get credit card |
| 3 | getBike | Bike | Get bike |

**Parameter:**

None

**Exception:**

None

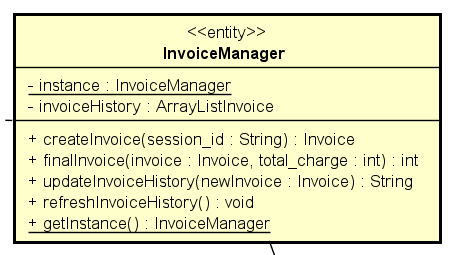
**Method**

None

**State**

None

## Class “InvoiceManager”



**Attribute**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| # | Name | Data type | Default value | Description |
| 1 | instance | DockManager | NULL | Instance of a dock |
| 2 | invoiceHistory | ArrayList<Invoice> | NULL | Invoice History |

**Operation**

|  |  |  |  |
| --- | --- | --- | --- |
| # | Name | Return type | Desciption |
| 1 | createInvoice | Invoice | Create new invoice |
| 2 | finalInvoice | int | Complete invoice |
| 3 | updateInvoiceHistory | String | Update invoice history |
| 4 | refreshInvoiceHistory | void | Refresh invoice history |
| 5 | getInstance | InvoiceManager | Get invoice instance |

**Parameter:**

* createInvoice
  + session\_id - String
* finallInvoice
  + invoice – Invoice
  + total\_charge: int
* updateInvoiceHistory
  + newInvoice - Invoice

**Exception:**

None

**Method**

None

**State**

None

## Class “CreditCard”

A picture containing table

Description automatically generated

**Attribute**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| # | Name | Data type | Default value | Description |
| 1 | id | String | NULL | Card id |
| 2 | cardNum | String | NULL | Card number |
| 3 | cardOwner | String | NULL | Card owner’s name |
| 4 | securityCode | String | NULL | Card security code |
| 5 | expDate | String | NULL | Card exp date |
| 6 | issuingBank | String | NULL | IssuingBank |

**Operation**

None

**Parameter:**

None

**Exception:**

None

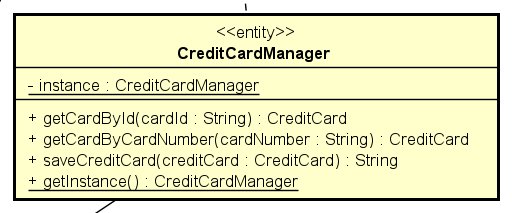
**Method**

None

**State**

None

## Class “CreditCardManager”



**Attribute**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| # | Name | Data type | Default value | Description |
| 1 | instance | CreditCardManager | NULL | Instance of a card |

**Operation**

|  |  |  |  |
| --- | --- | --- | --- |
| # | Name | Return type | Desciption |
| 1 | getCardById | CreditCard | Get card by id |
| 2 | getCardByCardNumber | CreditCard | Get card by card number |
| 3 | saveCreditCard | String | Save credit card |
| 4 | getInstance | CreditCardManager | Get card instance |

**Parameter:**

* getCardById
  + id - String
* getCardByCardNumber
  + carNumber – String
* saveCreditCard
  + credidCard - CreditCard

**Exception:**

None

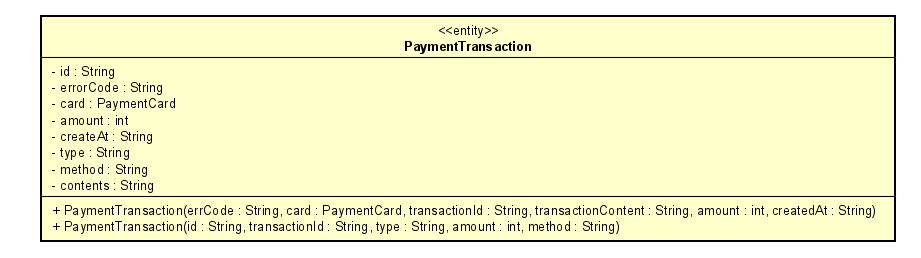
**Method**

None

**State**

None

## Class “PaymentTransaction”



**Attribute**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| # | Name | Data type | Default value | Description |
| 1 | errorCode | String | NULL | Error code |
| 2 | card | PaymentCard | NULL | Credit card |
| 3 | transactionId | String | NULL | Transaction id |
| 4 | transactionContent | String | NULL | Contents of transaction |
| 5 | amount | int | NULL | Transaction amount |
| 6 | createAt | String | NULL | Transaction create time |
| 7 | id | String | NULL | PaymentTransaction id |
| 8 | type | String | NULL | Transaction type |
| 9 | method | String | NULL | Transaction method |

**Operation**

None

**Parameter:**

None

**Exception:**

None

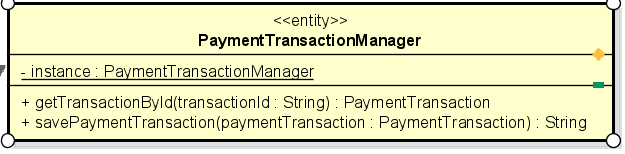
**Method**

None

**State**

None

## Class “PaymentTransactionManager”



**Attribute**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| # | Name | Data type | Default value | Description |
| 1 | instance | PaymentTransaction | NULL | Instance of transaction |

**Operation**

|  |  |  |  |
| --- | --- | --- | --- |
| # | Name | Return type | Desciption |
| 1 | getTransactionById | PaymentTransaction | Get transaction by Id |
| 2 | savePaymentTransaction | String | Save payment transaction |

**Parameter:**

* getTransactionById
  + transactionId - String
* savePaymentTransaction
  + paymentTransaction - Paymentransaction

**Exception:**

None

**Method**

None

**State**

None

## Class “Session”

Text, letter

Description automatically generated

**Attribute**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| # | Name | Data type | Default value | Description |
| 1 | id | String | NULL | Session id |
| 2 | bikeId | String | NULL | Bike Id |
| 3 | rentDockId | String | NULL | Dock rented Id |
| 4 | returnDockId | String | NULL | Dock Return Id |
| 5 | endTime | LocalDateTime | NULL | End time |
| 6 | startTime | LocalDateTime | NULL | Start time |

**Operation**

|  |  |  |  |
| --- | --- | --- | --- |
| # | Name | Return type | Desciption |
| 1 | isActive | boolean | Session is active or not |
| 2 | setActive | void | Set session active |
| 3 | getSessionLength | long | Get session length |

**Parameter:**

None

**Exception:**

None

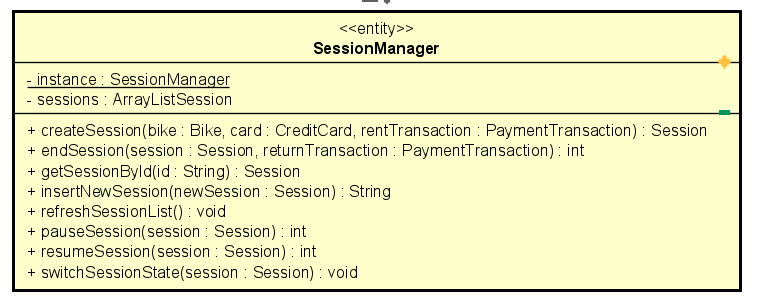
**Method**

None

**State**

None

## Class “SessionManager”



**Attribute**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| # | Name | Data type | Default value | Description |
| 1 | instance | SessionManager | NULL | Session instance |
| 2 | sessions | ArrayList<Session> | NULL | Session list |

**Operation**

|  |  |  |  |
| --- | --- | --- | --- |
| # | Name | Return type | Desciption |
| 1 | createSession | Session | Create a session |
| 2 | endSession | int | Complete session |
| 3 | getSessionById | Session | Get session by id |
| 4 | insertNewSession | String | Insert new session to db |
| 5 | refreshSessionList | void | Refresh session list |
| 6 | pauseSession | int | Pause session |
| 7 | resumeSession | int | Resume session |
| 8 | switchSessionState | void | Switch session state |

**Parameter:**

* createSession
  + bike - Bike
  + card – CreditCard
  + rentTransaction - PaymentTransaction
* endSession
  + session – Session
  + returnTransaction - PaymentTransaction
* getSessionById
  + id - String
* insertNewSession
  + newSession – Session
* pauseSession
  + session – Session
* resumeSession
  + session – Session
* switchSessionState
  + session – Session

**Exception:**

None

**Method**

None

**State**

None