Project 6 – Terminal Casino

Team Members:

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Dananjay Srinivas

Weitung Liao

Work Done:

Jay Seabrum: Completed implementing SlotsController and SlotsView. SlotsModel is rudimentarily set up.

Dananjay Srinivas: Set up the structure for BlackjackController, BlackjackView, BlackjackModel, and the abstract Controller and View classes.

Weitung Liao: Set up the structure for the abstract Model class and the database client file.

Changes/Issues Encountered:

Jay Seabrum: So far there have been no major roadblocks in implementing what I have done so far.

Dananjay Srinivas: I am getting a codesmell with respect to the BlackJack controller. The problem is while the class itself is very cohesive, it makes a lot of “POST” calls to the View.

Each message being posted to the View is different, but every time there is a POST it feels like I am violating DRY.

I have delegated some of the responsibilities from the controller to a BlackJack library that handles core functionality such as dealing, shuffling and tracking scores. Two problems that I notice are :

1. Given the way Python is, there are a lot of concrete classes and information being passed around (I argue that in terms of Python, it is as abstract as you can get). But coming from Java, it sometimes feels like a bit of codesmell. I would like to add though, that the design for our framework was largely based on Django - so I used that as a precedent to design how objects talk to each other in our project.
2. There is a lot of excess code handling small tasks. I feel these classes need restructuring, because some classes are still too big (for example: BlackJack controller).

Weitung Liao: In the model layer, we were thinking about passing the data parameter through DataObject or through Dictionary. Both approaches work, but we conclude that using DataObject, the object that defines the table data in the attribute, is more OO. On the other hand, using a dictionary may have some drawbacks like making typos and undefined data types.

Another issue is that, we have defined our DB connection in a separate Class and use a singleton pattern to give the user DB connection object when they want to use it. However, I'm wondering why don't we just make the whole DB connect function as a static method? It's simpler and cleaner. Why bother initiating a DB connect object when we use it. Yet, using static methods also has some drawbacks, saying it's harder to write unit tests and if we have more than one DB connection using objects would be easier to change. In conclusion, I think we should just make it as a static function since for now we will only need one DB connection,which is unlikely to change in the future and it would make the code simpler.

Another minor issue we face is should we avoid using try catch to handle things. For example, we want to update data to DB, and the DB would throw an error if using a duplicate key. We can either use a try catch to catch the duplicate key error to handle it, or we can check the duplicate key before inserting data. It seems like this situation does not have an absolute correct answer but I think it is better to check the duplicate key before inserting it because if we handle different errors, using try catch would result in a multi-layer of try catch.

Patterns:

So far, the following patterns have been implemented:

Command: In the SlotsController, the controller asks for input form the user to set the difficulty level in slots. The controller itself doesn't know what to do with the input, but it delegates the interpretation of the input to the SlotsView AskBet module which houses the command pattern to assign the correct difficulty level for Slots.

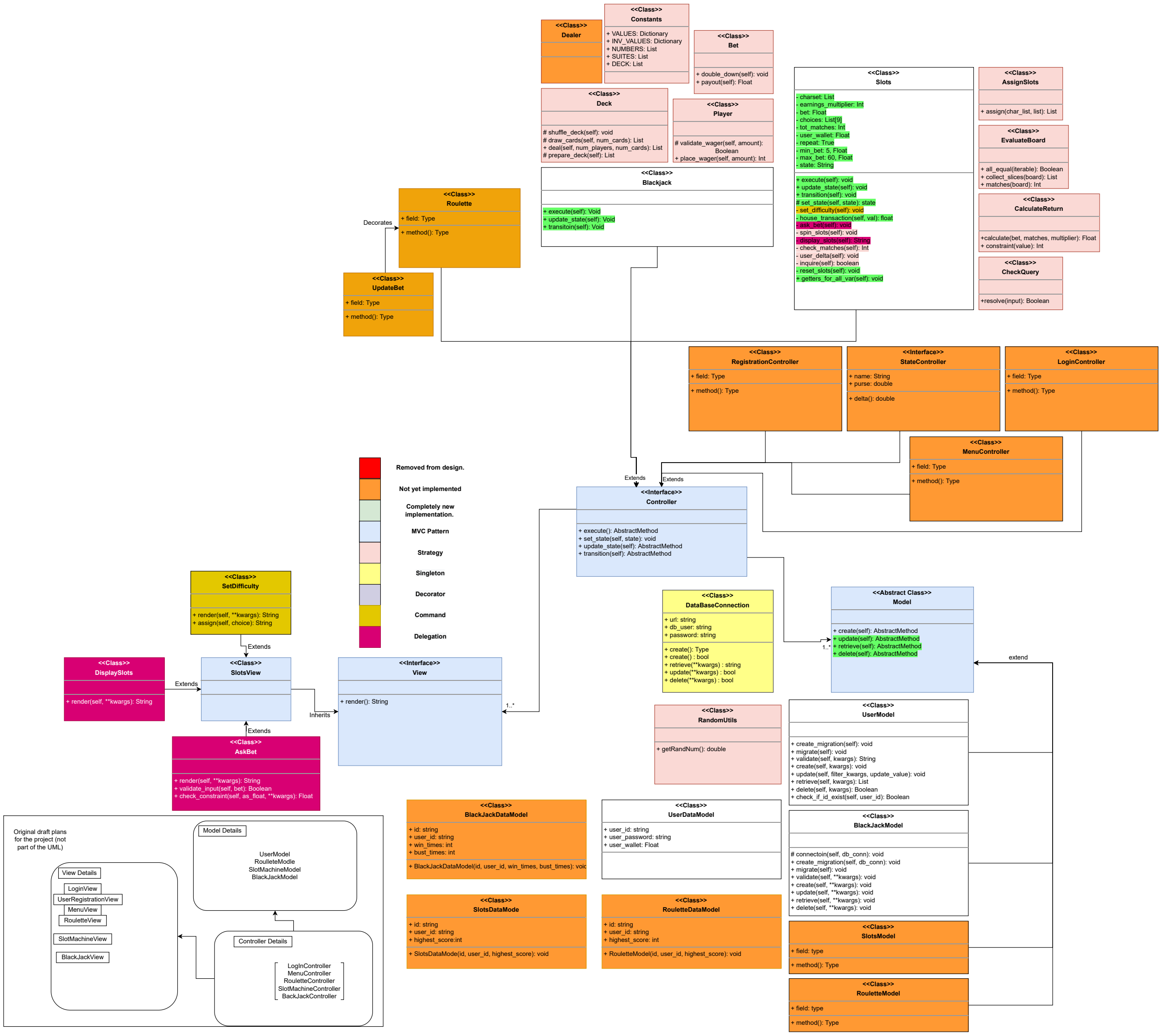
Strategy: In the SlotsController, for example, all of the modules delegate to another class somewhere else in the structure of the project. Because of this use of strategy, most of what the Slots controller does is to get things going in the right order.

Singleton: The DataBaseConnection class is a Singleton. We don't need multiple db connections for persisting data so having it invoked once is useful.

MVC: The backbone of the project is on this pattern. The games themselves are their own controllers, which then call specific Views to print useful information to the console or to assign useful returns to the controller. The Model's outline is set up to support specific data for each of the games and to handle the User so that the controllers can call these and process and change data as needed.

Plan for Next Iteration:

1. Create the MainMenu, Settings, Login controllers.
2. Set up the structure for how users can log in and set passwords (and how these data need to be persisted)
3. Consider combining UserDataObject(Class describes the column in the user table in DB) with UserModel(Class handles the CRUD of the user table) by putting the column defining info as parameters of the UserModel. It would make it more neat while still have a good OO design
4. Finish the rest of the CRUD features for each data table we have
5. Consider making the DB connection as a static function instead of a singleton. It may make it just simpler?
6. General cleanup and consolidation of smaller files.


<<Class>> Dealer
<<Class>> Constants
+ VALUES: Dictionary
+ INV_VALUES: Dictionary
+ NUMBERS: List
+ SUITES: List
+ DECK: List
<<Class>> Bet
+ double_down(self): void
+ payout(self): Float
<<Class>> Deck
shuffle_deck(self): void
draw_cards(self, num_cards): List
+ deal(self, num_players, num_cards): List
# prepare_deck(self): List
<<Class>> Player
validate_wager(self, amount): Boolean
+ place_wager(self, amount): Int
<<Class>> Blackjack
+ execute(self): Void
+ update_state(self): Void
+ transitoin(self): Void
<<Class>> Slots
- charset: List
- earnings_multiplier: Int
- bet: Float
- choices: List[9]
- tot_matches: Int
- user_wallet: Float
- repeat: True
- min_bet: 5, Float
- max_bet: 60, Float
- state: String
+ execute(self): void
+ update_state(self): void
+ transition(self): void
# set_state(self, state): state
- set_difficulty(self): void
- house_transaction(self, val): float
- ask_bet(self): void
- spin_slots(self): void
- display_slots(self): String
- check_matches(self): Int
- user_delta(self): void
- inquire(self): boolean
- reset_slots(self): void
+ getters_for_all_var(self): void
<<Class>> AssignSlots
+ assign(char_list, list): List
<<Class>> EvaluateBoard
+ all_equal(iterable): Boolean
+ collect_slices(board): List
+ matches(board): Int
<<Class>> CalculateReturn
+calculate(bet, matches, multiplier): Float
+ constraint(value): Int
<<Class>> CheckQuery
+resolve(input): Boolean
<<Class>> Roulette
+ field: Type
+ method(): Type
Decorates
<<Class>> UpdateBet
+ field: Type
+ method(): Type
<<Class>> RegistrationController
+ field: Type
+ method(): Type
<<Interface>> StateController
+ name: String
+ purse: double
+ delta(): double
<<Class>> LoginController
+ field: Type
+ method(): Type
<<Class>> MenuController
+ field: Type
+ method(): Type
Removed from design.
Not yet implemented
Completely new implementation.
MVC Pattern
Strategy
Singleton
Decorator
Command
Delegation
Extends
Extends
<<Interface>> Controller
+ execute(): AbstractMethod
+ set_state(self, state): void
+ update_state(self): AbstractMethod
+ transition(self): AbstractMethod
<<Class>> DataBaseConnection
+ url: string
+ db_user: string
+ password: string
+ create(): Type
+ create() : bool
+ retrieve(**kwargs) : string
+ update(**kwargs) : bool
+ delete(**kwargs) : bool
<<Abstract Class>> Model
+ create(self): AbstractMethod
+ update(self): AbstractMethod
+ retrieve(self): AbstractMethod
+ delete(self): AbstractMethod
1..*
extend
<<Class>> SetDifficulty
+ render(self, **kwargs): String
+ assign(self, choice): String
Extends
<<Class>> DisplaySlots
+ render(self, **kwargs): String
Extends
<<Class>> SlotsView
Inherits
<<Interface>> View
+ render(): String
1..*
Extends
<<Class>> AskBet
+ render(self, **kwargs): String
+ validate_input(self, bet): Boolean
+ check_constraint(self, as_float, **kwargs): Float
<<Class>> RandomUtils
+ getRandNum(): double
<<Class>> UserModel
+ create_migration(self): void
+ migrate(self): void
+ validate(self, kwargs): String
+ create(self, kwargs): void
+ update(self, filter_kwargs, update_value): void
+ retrieve(self, kwargs): List
+ delete(self, kwargs): Boolean
+ check_if_id_exist(self, user_id): Boolean
Original draft plans for the project (not part of the UML)
Model Details
UserModel
RoulleteModle
SlotMachineModel
BlackJackModel
View Details
LoginView
UserRegistrationView
MenuView
RouletteView
SlotMachineView
BlackJackView
Controller Details
LogInController
MenuController
RouletteController
SlotMachineController
BackJackController
<<Class>> BlackJackDataModel
+ id: string
+ user_id: string
+ win_times: int
+ bust_times: int
+ BlackJackDataModel(id, user_id, win_times, bust_times): voic
<<Class>> UserDataModel
+ user_id: string
+ user_password: string
+ user_wallet: Float
<<Class>> BlackJackModel
connectoin(self, db_conn): void
+ create_migration(self, db_conn): void
+ migrate(self): void
+ validate(self, **kwargs): void
+ create(self, **kwargs): void
+ update(self, **kwargs): void
+ retrieve(self, **kwargs): void
+ delete(self, **kwargs): void
<<Class>> SlotsDataMode
+ id: string
+ user_id: string
+ highest_score:int
+ SlotsDataMode(id, user_id, highest_score): void
<<Class>> RouletteDataModel
+ id: string
+ user_id: string
+ highest_score: int
+ RouletteModel(id, user_id, highest_score): void
<<Class>> SlotsModel
+ field: type
+ method(): Type
<<Class>> RouletteModel
+ field: type
+ method(): Type