EPI-USE LABS

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OBJECT-ORIENTED PROGRAMMING

TECHNICAL ASSESSMENT

2022

1. Problem Statement

Five-card draw is a variant of poker where each player receives a hand of 5 cards, is then allowed to swap any number of those cards for new ones, and then competes against each other based on the standard 5 card poker hand strength. You need to design and develop a console-based application which will deal and evaluate poker hands for a simplified version of the five-card draw variant. Like the five-card draw variant, the application will have to deal a hand of 5 cards, but unlike the five-card draw variant, no swapping will be allowed.

The application will be required to provide the following functionality:

- Simulate shuffling a standard deck of 52 cards.
- Deal a single hand of 5 cards to the player.
- Evaluate the player's hand, informing them of the highest ranked poker hand that matches their hand of 5 cards.

The standard 5 card poker hand strength applies. Listed in decreasing rank, these hands are:

1. Straight Flush
2. Four of a Kind
3. Full House
4. Flush
5. Straight
6. Three of a Kind
7. Two Pair
8. One Pair
9. High Cards

2. Technical Requirements

- The application is to be developed as a console application in any object orientated programming language you feel comfortable with.
- Should your solution make use of C#/.NET, please provide a published EXE which can be used to run your program without the need for compilation.
- You should preferably send us a link with your solution on Git as opposed to an email with a zip file as an attachment. (If not possible we can work with the zip file).

- You should include a build script which can compile, package and run the application.
- The application code should also be properly unit tested, and the build script should be able to run the unit tests.

3. Example output of running the application

```
./run.sh
Shuffling ... Shuffling ... Shuffling ...
Your hand: 3♣ 7♦ 7♥ 7♠ K♥
You have: Three of a Kind
```

4. Design Constraints

The application should be designed to follow object-orientated principles and good coding practices. Preference should be given to the design of an extensible and maintainable application, rather than focusing on efficiency and algorithms. Comments should be added as necessary. The application will be evaluated on the use of object-orientation, data structures, separation of concerns, maintainability and overall quality.

5. External Resources

You are allowed to make use of any external resources such as those on the internet (Google, StackOverflow, etc.) as well as external libraries, if the core of the application is your own code. We recommend that you either use an existing poker hand matching algorithm or include a library rather than creating your own, as this could take a long while to do. We are primarily interested in how the different modules of the application relate to each other, rather than the exact implementation of those modules.

6. Consideration Points

Keep the following in consideration as possible discussion points. You are not required to implement these items, but your design should allow for the application to be extended to accommodate these items:

- We would like to replace the shuffling algorithm with a more realistic shuffling algorithm.
- We would like to accommodate a different poker variant, such as Badugi, where not only the size of the hand is changed (4 cards instead of 5), but the hand ranks are also changed.
- We would like to change the application from a console-based application to a web based (HTML frontend with the backend in your chosen language) application.