

Games Development – Web Development and Databases

Year 3

2023/2024 Academic Year

Assignment 3 – A database-enabled Blackjack for the Cloud, with statistical analysis.

Motivation for Assignment

With a working HTMx-enabled Blackjack game “in the can”, it’s now time to integrate a SQL-based database backend to allow for the collection of game statistics. Once collected, the statistics can be summarised with easy-to-understand visuals.

Details of Assignment

Part #1: The Blackjack code discussed in class is available on Teams (under the Files tab). Take this code and update it to include your CSS styling from CA #2. See the `blackjack-webapp.zip` file.

Part #2: Decide on **three** statistics you would like to capture for your game (with the “win-rate” discussed in class being one of these), then design a database schema to store your statistics data in MariaDB. Create the required database, user, and table(s) to store – and provide access to – your game’s data. As part of your submission, include the SQL statements you used to prepare your database in a file called `schema.sql`¹.

Part #3: Create the Python/DBcm code needed to populate your database’s tables with your raw data. This code should be created, executed, and tested within a Jupyter Notebook, so as to confirm it works independently of your Blackjack code. Call this notebook: `GetData.ipynb`.

Part #4: Integrate your Python/DBcm code into the Blackjack webapp code from Part #1, enabling the automatic collection of your raw statistical data from your game *as it is played*.

Part #5: With the raw data captured, create another notebook to create three visualisations of your statistical data. This new notebook should be based on the code from the `TalkingToDatabases.ipynb` notebook discussed in class. The horizontal bar chart from class is to be the first of your three visualisations: you are to devise two more visualisations (*neither* of which can be a horizontal bar chart).

Part #6: Deploy the database-enabled version of your Blackjack game to PythonAnywhere. (The work you did with Part #2 should come in handy here,² in addition to the step-by-step video recording from class).

1 I will use the SQL in this file to recreate your database setup on my laptop, prior to running your code. **Hint:** would the `mysqldump` command help with this task?

2 In addition to these two PDFs available from the Files tab on Teams: see `Deploy.pdf` and `Deploy-DB.pdf`.

Marks Allocation

- **50%** with the following breakdown:

up-to 5% for Part #1,
up-to 10% for Part #2,
up-to 10% for Part #3,
up-to 10% for Part #4,
up-to 10% for Part #5, and
up-to 5% for Part #6.

Note: Over and above the 50 marks allocated as shown, up-to an extra 10 marks are available to the **first** student who consistently/repeatedly demonstrates a bug in my code from Part #1. Any such demonstration needs to be shown against the code in the ZIP, not against your amended code.

To submit your work, ZIP the entire contents of your folder(s), then copy the ZIP to your University OneDrive, before sharing the created OneDrive link with paul.barry@setu.ie. Email the URL of your PythonAnywhere-deployed Blackjack game to paul.barry@setu.ie, also.

The due date/time for this assignment is: **5:00pm on Friday December 8th 2023.**

This is an individual assignment: you are expected to work on your own, and that the work you submit is written/created by you. You must declare if this is not the case. If you collaborate with anyone else, this must also be declared.