CSC 122 Python Applications

Lesson5: Project 1-D – Wake Golf Tour

Objectives

In this assignment, students will:

- Use Python's database API to create a database to hold data from class objects.
- Create and populate database tables from data stored in CSV files, using the SQL CREATE TABLE commands.
- Write basic SQL queries to extract information from a set of database tables.

Python Programming Instructions

Please use PyCharm or a text editor (Notepad++ is good for Python) to type your program code files. You can use PyCharm or the command line to test your program. See documents in Course Resources for more details about these environments.

a. If you are using **PyCharm**, then name the project exactly **WakeGolfTourD**. The Python source code will be in the '**WakeGolfTourD'** folder. Place the Python program file, **golf_tour.py**, the seven data class definitions files, the database creation class definition file (**golfTourDatabaseHelper.py**) and the **input files** in the **WakeGolfTourD** project folder. The output files should be in the folder after running the program.

b. If you are using the **command line interface**, create a **WakeGolfTourD** folder. Place the Python program file, **golf_tour.py**, the seven data class definitions files, the database creation class definition file (**golfTourDatabaseHelper.py**) and the **input files** in the **WakeGolfTourD** project folder. Run the program from that folder. The output files should be in the folder after running the program.

Once you have completed the assignment, zip up the **WakeGolfTourD** folder using directions from the document, **Creating and Submitting Programs**. Submit the **WakeGolfTourC.zip** file to Blackboard for credit.

Programs that are submitted incorrectly will not be graded.

Program Specifications

Project Description

This fourth part of the project, **Project 1-D**, has one Python program file called **golf_tour.py**. It also has seven data class definition files, **golfCourse.py**, **hole.py**, **golfer.py**, **tournament.py**, **tournGolfer.py**, **round.py,** and **golferRoundScores.py**. There is also the class definition for **GolfTourDatabaseHelper** in **golfTourDatabaseHelper.py.** The main program has 15 functions, including the **main** function. Details about these functions are given to you in comments within the functions themselves and are summarized in the **Wake Golf Tour Specification** document.

You have finished most of Project 1. In Project 1-D, you must update a class that uses the SQL CREATE TABLE statement to create the seven tables in the SQLite database. The SQL statements are strings at the top of the **golfTourDatabaseHelper.py** file. The rest of the file contains the class definition used to create the database. You do not have to code any of the class definition parts, just five of the SQL CREATE TABLE statements. Once this is completed, you will then code several SQL queries that extract information from various Wake Golf Tour database tables and display the query result on the console.

Note: Even though you shouldn't change any of the code in the definition parts, you should still take a look at it to see if it makes sense.

Project Part D:

The starter code has updates to **golf_tour.py** that will make the calls to create a **SQLite database** and **tables** and to add the object data to the database. You will need to modify the **GolfTourDatabaseHelper** class to create five of the seven tables from the seven classes. Just code the SQL CREATE TABLE statements at the top of the **golfTourDatabaseHelper.py** file.

GolfTourDatabaseHelper class definition: **golfTourDatabaseHelper.py**

Next, write a few functions to display data from the tables using SQL query statements and the Python DB_API. The code for three example functions is provided and thoroughly explained in the document, **Relational Database Basics**, that is given as a reading assignment and as input to the Discussion Board Forum. Two of these sample functions are included with their code in the **golf_tour.py** file for you:

show_golf_course_last3_holes (database_name)
show_tourn_scores_top5_Apex3 (database_name)

You will need to add two additional functions to **golf_tour.py:**

show_golf_course_par5_holes (database_name)
show_tournaments_for_golfer_Jo (database_name)

There is an additional SQL query function that should be added to **golf_tour.py** in order to test your Discussion Board assignment. The shell for this function is in **golf_tour.py** and is called **show_my_query**. See the Discussion Board assignment for more information.

Program Starter Code

There is a zipped folder in Blackboard called **'Project1DStarterCode.zip'** that contains the **input files**, the starter **golf_tour.py** program and the class definition files, **golfCourse.py**, **hole.py**, **golfer.py**, **tournament.py**, **tournGolfer.py**, **round.py**, **golferRoundScores.py**, and **golfTourDatabaseHelper.py**, for **Project 1-D**. Each of the provided files should be placed in the same directory as your program, **golf_tour.py**.

golf_courses_infile = "golfCoursesInput.csv"
tournaments_infile = "tournamentsInput.csv"
golfers_infile = "golfersInput.csv"
golfer_scores_infile = "roundScoresInput.csv"

Program Output Data

The input data are read into the **golf_tour.py** program and used by the the **'create'** functions. This input data along with data from other **'create'** functions is used to create a list of objects containing the data we will insert into our SQL database tables.

The object lists are written to the screen, and to the following files:

golf_courses_file = "golfCourses.csv"
holes_file = "holes.csv"
golfers_file = "golfers.csv"
tournaments_file = "tournaments.csv"
tourn_golfers_file = "tournGolfers.csv"
rounds_file = "rounds.csv"
golfer_scores_file = "golferRoundScores.csv"

When the program finishes correctly, there will be a **SQLite** database in the same directory as the program:

WakeGolfTour.db

The results of the SQL queries are also written to the screen.

Provided Code

The **golf_tour.py** program has the following function and class definition code provided for you. **Do not change the code in these functions:**

main
create_golf_courses
get_tourn_golfer_id
write_objs_to_file
show_golf_course_last3_holes
show_tourn_scores_top5_Apex3
GolfCourse in **golfCourse.py**
GolferRoundScores in **golferRoundScores.py**
GolfTourDatabaseHelper in **golfTourDatabaseHelper.py**
- Class definition
- **SQL CREATE TABLE** statements for **GolfCourse** and **Hole**

Required Code

You must copy your existing code from Project 1-A for:

create_holes – From Project 1-A
create_golfers – From Project 1-A
Hole in **hole.py** – From Project 1-A
Golfer in **golfer.py** – From Project 1-A

You must copy your existing code from Project 1-B for:

create_tourn_golfers – From Project 1-B
create_rounds – From Project 1-B
create_tournaments – From Project 1-B
Tournament in **tournament.py** – From Project 1-B
TournGolfer in **tournGolfer.py** – From Project 1-B
Round in **round.py** – From Project 1-B

You must copy your existing code from Project 1-C for:

create_golfer_round_scores – From Project 1-C
get_round_id – From Project 1-C

You must also provide the SQL command syntax to query the database for these functions:

show_golf_course_par5_holes:

- Show a list of golf course names with the total par and the hole number and par for each hole where the par is equal to 5: Use the WHERE clause: WHERE hole_par = 5

show_tournaments_for_golfer_Jo:

- Show a list of tournaments and golfer names played by golfers whose name begins with Jo: Use the WHERE clause: WHERE golfer_name LIKE 'Jo%'

In GolfTourDatabaseHelper in **golfTourDatabaseHelper.py**
You must provide the SQL CREATE TABLE statements for:

- **Golfer, Tournament, Round, TournGolfer** and **GolferRoundScores**

Program Execution

Please re-read the **Wake Golf Tour App** and **Wake Golf Tour Specification** documents, until you have grasped the purpose of Project 1.

To Begin:

1. Please open the **Project1DStarterCode.zip** file, now!

2. Replace the **golfCourse.py**, **hole.py**, and **golfer.py** class definition files with the ones from Project 1-A

3. Replace the **tournament.py**, **tournGolfer.py**, and **round.py** class definition files with the ones from Project 1-B

4. In **golf_tour.py**, copy the code for the **create_golfers** and **create_holes** from Project 1-A.

5. In **golf_tour.py**, copy the code for the **create_tournaments, create_rounds,** and **create_tourn_golfers** from Project 1-B.

6. In **golf_tour.py**, copy the code for the **create_golfer_round_scores,** and **get_round_id** from Project 1-C.

7. To better understand this project, organize document notes on paper, note cards, or on a whiteboard.

8. Come to Open Lab to get help.

9. Email me questions and code to review, if you need help.

10. You may team up with others. Use the Students Helping Students Discussion Board in Blackboard to find partners.

You are not on your own. Your teacher, the lead instructor and other students can help you.

Program Output to Screen:

Wake Golf Tour Project 1

The GolfCourse object list:

< See Project 1-A output >

The Hole object list:

< See Project 1-A output >

The Golfer object list:

< See Project 1-A output >

The Tournament object list:

< See Project 1-B output >

The Round object list

< See Project 1-B output >

The TournGolfer object list

< See Project 1-B output >

The GolferRoundScores object list

< See Project 1-C output >

Database created and opened successfully
GolfCourse Table created
Golf Hole Table created
Golfer Table created
Tournament Table created
Tournament Round Table created
Tournament Golfer Table created
Golfer Round Scores Table created

Last 3 holes, of each golf course

('Raleigh Golf Course', 72, 16, 4)
('Raleigh Golf Course', 72, 17, 4)
('Raleigh Golf Course', 72, 18, 4)
('WTCC Golf Course', 72, 16, 5)
('WTCC Golf Course', 72, 17, 4)
('WTCC Golf Course', 72, 18, 4)
('Garner Golf Course', 72, 16, 4)
('Garner Golf Course', 72, 17, 3)
('Garner Golf Course', 72, 18, 4)
('Cary Golf Course', 72, 16, 4)
('Cary Golf Course', 72, 17, 4)
('Cary Golf Course', 72, 18, 4)
('Apex Golf Course', 72, 16, 4)
('Apex Golf Course', 72, 17, 4)
('Apex Golf Course', 72, 18, 4)

Total Scores For Top 5 Golfers in Apex 3 Tournament

('Randy Fowler', 'Apex 3', 141)
('Joey Watson', 'Apex 3', 146)
('Andy Palmer', 'Apex 3', 146)
('Lee Trevor', 'Apex 3', 148)
('Jason Duffy', 'Apex 3', 148)

Show the Par 5 Hole Numbers For Each Golf Course

('Raleigh Golf Course', 72, 6, 5)
('Raleigh Golf Course', 72, 15, 5)
('WTCC Golf Course', 72, 7, 5)
('WTCC Golf Course', 72, 16, 5)
('Garner Golf Course', 72, 5, 5)

('Garner Golf Course', 72, 13, 5)
('Cary Golf Course', 72, 7, 5)
('Cary Golf Course', 72, 10, 5)
('Apex Golf Course', 72, 4, 5)
('Apex Golf Course', 72, 11, 5)

Tournaments Played by Golfer's Whose Name Begins With Jo

('Joey Watson', 'Raleigh 1')
('Joey Watson', 'WTCC 1')
('Joey Watson', 'WTCC 3')
('Joey Watson', 'Garner 2')
('Joey Watson', 'Cary 1')
('Joey Watson', 'Cary 3')
('Joey Watson', 'Apex 2')
('Joey Watson', 'Apex 3')
('Jordan Speed', 'Raleigh 2')
('Jordan Speed', 'WTCC 1')
('Jordan Speed', 'WTCC 3')
('Jordan Speed', 'Garner 2')
('Jordan Speed', 'Garner 3')
('Jordan Speed', 'Cary 3')
('Jordan Speed', 'Apex 2')

Process finished with exit code 0