PROJECT SYNOPSIS

Of

FANTASY CRICKET GAME

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Programming with Python

<u>PROBLEM STATEMENT</u>

Build a desktop application which is a fantasy cricket game where you would create a virtual team of cricket players and score points on how the players perform in different matches.The game should have all the features displayed in the mock-up screens in the scenario. To calculate the points for each player, you can use rules similar to the sample rules displayed below.

Sample of Rules :

Batting
● 1 point for 2 runs scored
● Additional 5 points for half century
● Additional 10 points for century
● 2 points for strike rate (runs/balls faced) of 80-100
● Additional 4 points for strike rate>100
● 1 point for hitting a boundary (four) and 2 points for over boundary (six)

Bowling
● 10 points for each wicket
● Additional 5 points for three wickets per innings
● Additional 10 points for 5 wickets or more in innings
● 4 points for economy rate (runs given per over) between 3.5 and 4.5
● 7 points for economy rate between 2 and 3.5
● 10 points for economy rate less than 2

Fielding
● 10 points each for catch/stumping/run out

Objective :

- To create a Desktop Application of "Fantasy Cricket" game. A user should be able to select his team from the available players list by double Clicking on them.

- Create a Database for all the players and store the team created by the user in it. The Database should have stats of all the players, Record of the matches and Teams.

- Finally convert .ui file into .py file and populate it with action listeners. Connect Data from Database to the GUI file with the help of Python.

- Code for evaluation criteria for each player and display them along with the team score in that match.

- At the same time, taking care of all the exceptions and showing error dialog whenever selection criteria is violated or invalid commands are passed.

Tools And Technologies Used

Python :

Python is an interpreted, high-level, general-purpose programming language. Its language constructs and object-oriented approach aim to help programmers write clear, logical code for small and large-scale projects.Python is dynamically typed and garbage-collected. It supports multiple programming paradigms, including structured (particularly, procedural), object-oriented, and functional programming.

Python is meant to be an easily readable language. Its formatting is visually uncluttered, and it often uses English keywords where other languages use punctuation. Unlike many other languages, it does not use curly brackets to delimit blocks, and semicolons after statements are optional. It has fewer syntactic exceptions and special cases than C or Pascal.

Python's large standard library, commonly cited as one of its greatest strengths, provides tools suited to many tasks. It includes modules for creating graphical user interfaces, connecting to relational databases, generating pseudorandom numbers, arithmetic with arbitrary-precision decimals, manipulating regular expressions, and unit testing.

In this, project python has been a best tool for connecting SQL and Qt Designer. The UI file generated from the Qt Designer can be converted into .py file from command :

```
pyuic5 -x <file_name.ui> -o <file_name.py>
```

Then the generated .py file can be edited and populated with functions, which further act as "action listeners". Thus a specific action is performed when an event occurs .

Also, python provides a sqlite3 module, which facilitates the import and export of data from all types of relational Database. This data can be then displayed in the GUI application.

SQL :

SQL Structured Query Language is a special-purpose programming language designed for managing data held in a relational database management system (RDBMS), or for stream processing in a relational data stream management system (RDSMS).

Originally based upon relational algebra and tuple relational calculus, SQL consists of a data definition language, data manipulation language, and a data control language. The scope of SQL includes data insert, query, update and delete, schema creation and modification, and data access control. Although SQL is often described as, and to a great extent is, a declarative language (4GL), it also includes procedural elements.

In this project,

To keep an organised record of all the players and teams and be constantly able to edit the Database values, SQL was a perfect fit for all the needs. It is very easy to make a query in SQL as they are logical english statements which you understand very quickly.

Spyder :

Spyder is an open source cross-platform integrated development environment (IDE) for scientific programming in the Python language. Spyder integrates with a number of prominent packages in the scientific Python stack, including NumPy, SciPy, Matplotlib, pandas, IPython, SymPy and Cython, as well as other open source software. It is released under the MIT license.

The IDE Spyder from Anaconda distribution is best suited for the Python coding in this project. It has very good features for text editing of code like, syntax highlighting, introspection, code completion,Support for multiple IPython consoles,the ability to explore and edit variables from a GUI, and many more.

SQLite Studio :

SQLite Studio is free of charge for everybody, for any purpose (including commercial). It's safe, as anyone can review source code. It is embedded with many features useful for seamlessly managing data. To name a few, You can execute SQL statements that refer to multiple databases within a single query.

The SQL Editor window assists users with SQL syntax hints & highlighting, provides pretty-print code formatter, marks syntax errors. Works on all 3 major platforms - Windows, MacOS X, Linux. The application currently supports QtScript (JavaScript) and Tcl scripting languages. Scripts can be used as generators for data populating, custom SQL functions, custom collation sequences).
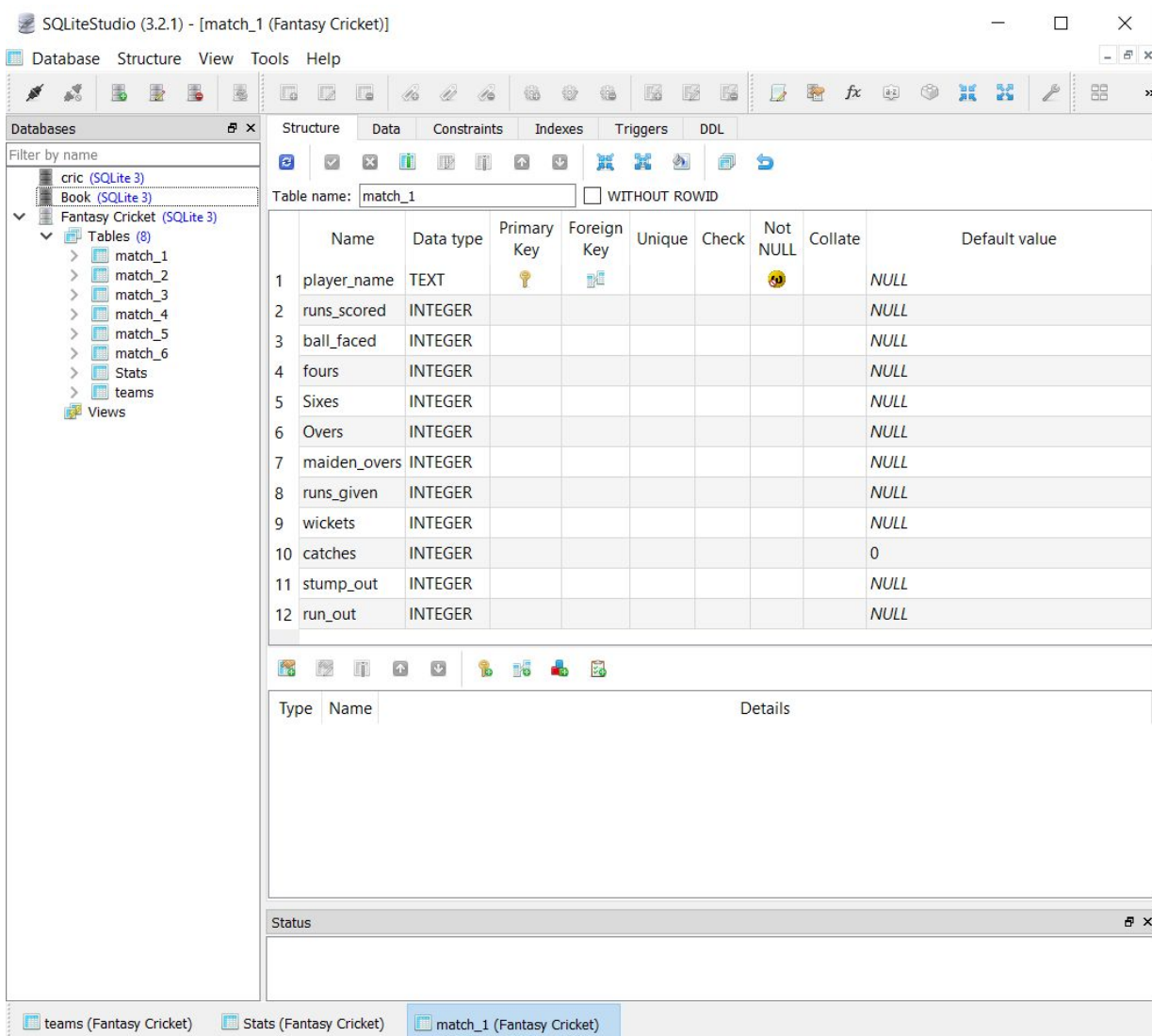
Qt Designer :

Qt Designer is a tool for designing and building graphical user interfaces (GUIs) from Qt widgets. It is possible to compose and customize the widgets or dialogs and test them using different styles and resolutions directly in the editor. Widgets and forms created with Qt Designer are integrated with programmed code, using the Qt signals and slots mechanism.

It can be installed in python along with pyqt5-tools. It greatly facilitates the development of Window applications along with multiple dialogs and forms.

It reduces the amount and time invested in coding for a simple GUI window. The Graphic interface of Qt Designer is very simple and easy to use.

It is a tool for quickly building graphical user interfaces with widgets from the Qt GUI framework. It gives you a simple drag-and-drop interface for laying out components such as buttons, text fields, combo boxes and more.
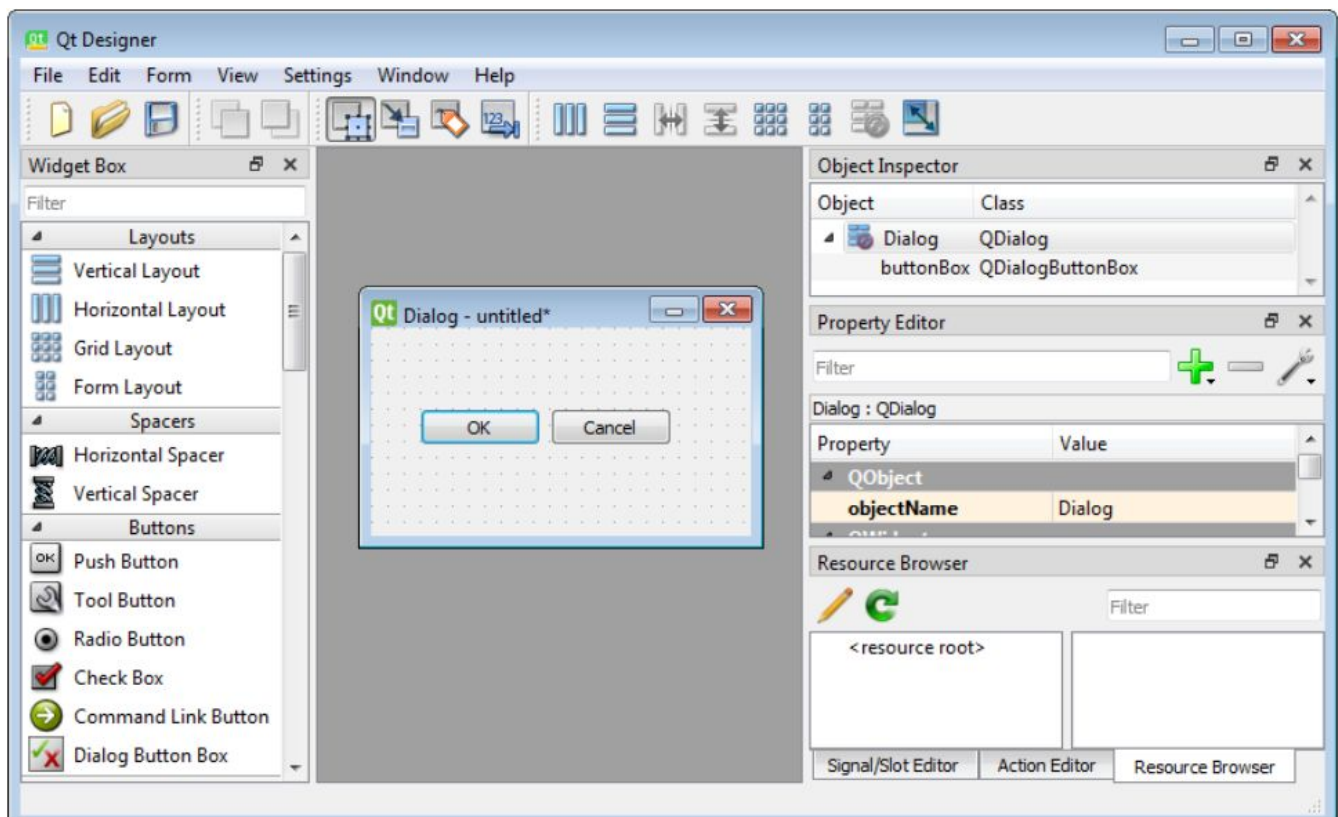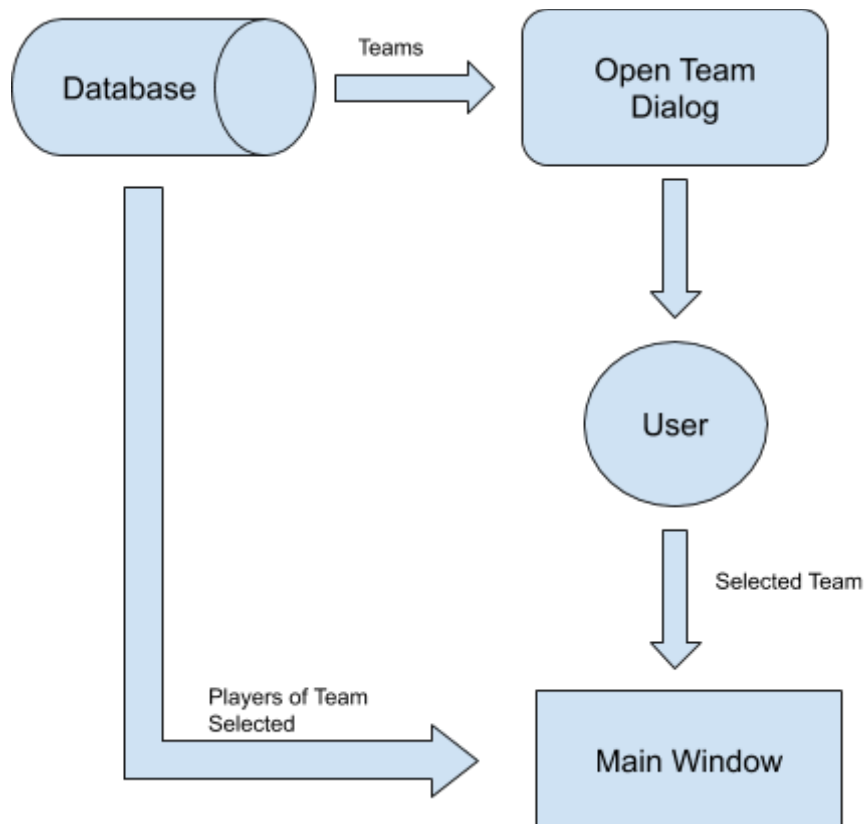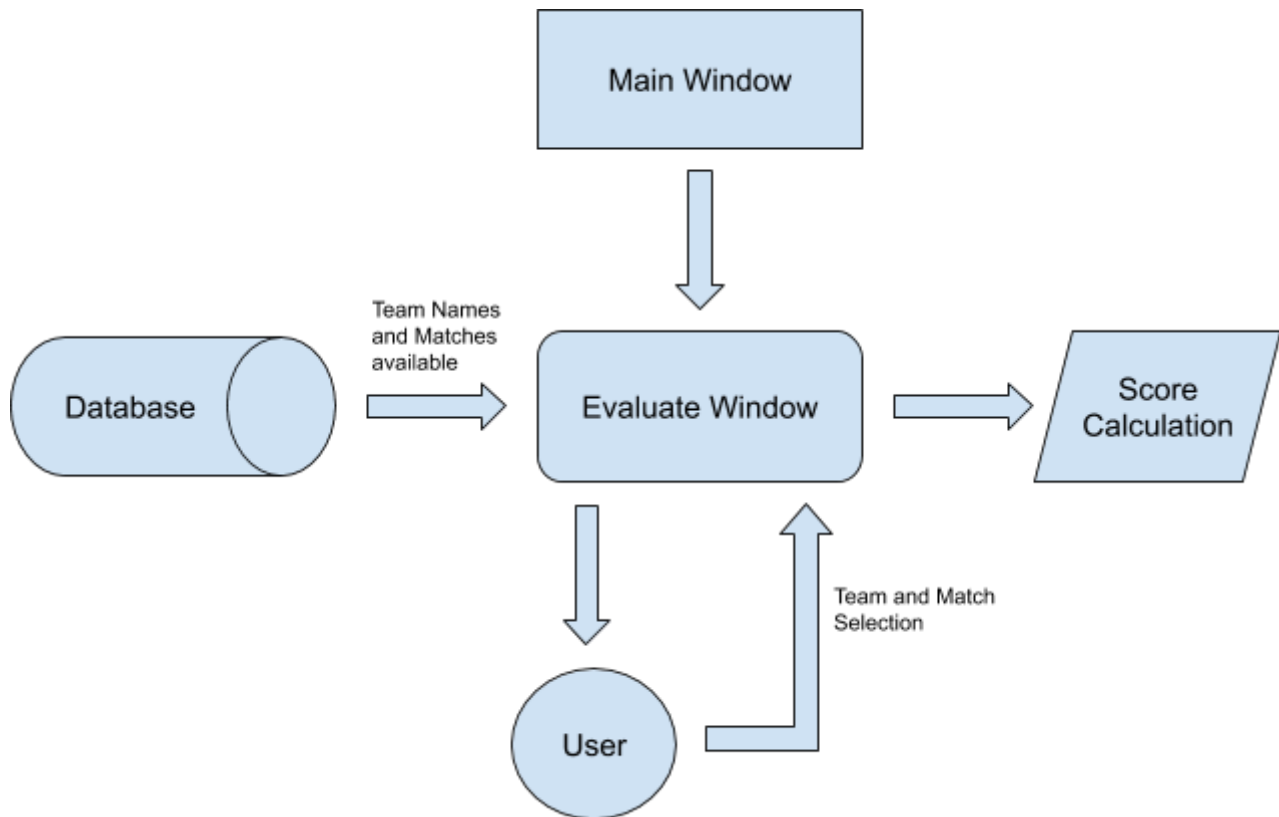
Data Flow Diagram

- *When You have to select a new Team*
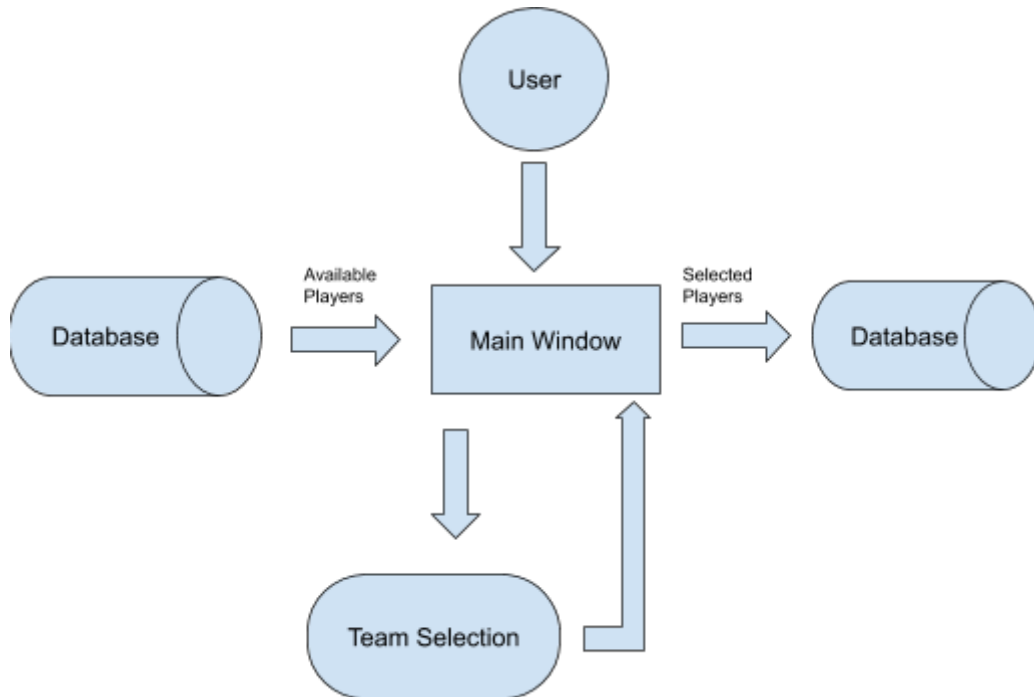
- *When You have to open an existing team*

- *When You want to Evaluate your team in a match*

Data Structure - Tables

- **Match**

Table name:	match_1		□ WITHOUT ROWID						
	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	
1	player_name	TEXT	🔑	🔗			🚫		NULL
2	runs_scored	INTEGER							NULL
3	ball_faced	INTEGER							NULL
4	fours	INTEGER							NULL
5	Sixes	INTEGER							NULL
6	Overs	INTEGER							NULL
7	maiden_overs	INTEGER							NULL
8	runs_given	INTEGER							NULL
9	wickets	INTEGER							NULL
10	catches	INTEGER							0
11	stump_out	INTEGER							NULL
12	run_out	INTEGER							NULL

● Stats

Table name: Stats ☐ WITHOUT ROWID

	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	
1	player_name	TEXT	🔑				🚫		NULL
2	match_played	INTEGER					🚫		NULL
3	runs_scored	INTEGER							0
4	100s	INTEGER							0
5	50s	INTEGER							0
6	wickets	INTEGER							0
7	value	INTEGER							50
8	role	TEXT					🚫		NULL

● teams

Table name: teams ☐ WITHOUT ROWID

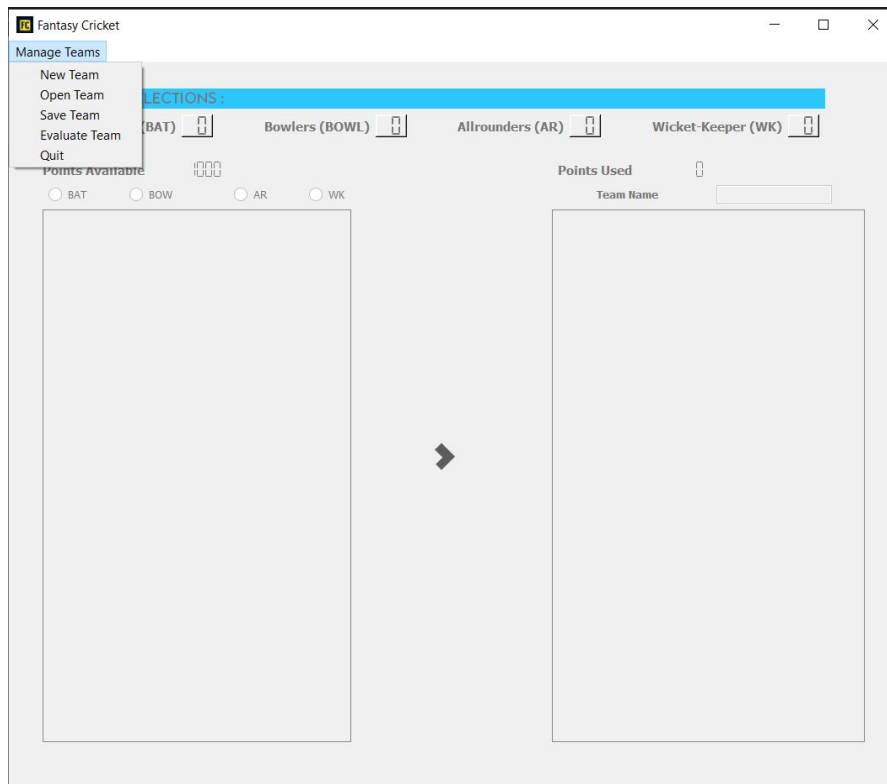|	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	
1	team_name	TEXT	🔑				🚫		NULL
2	players	STRING							NULL
3	team_value	INTEGER							0

WORKING

1. On Clicking the Fantasy Cricket Icon, the main window opens.
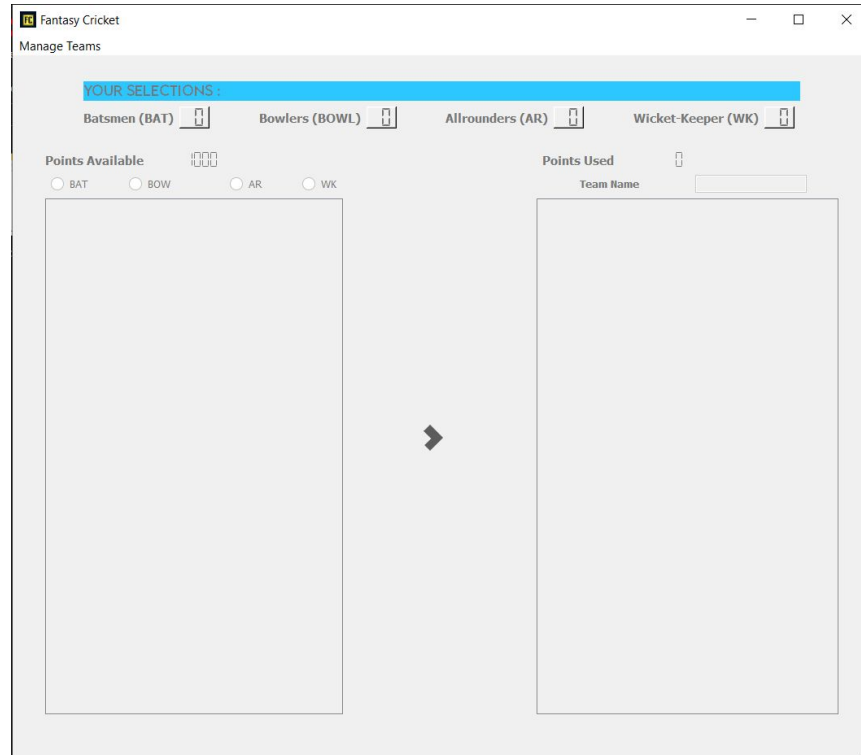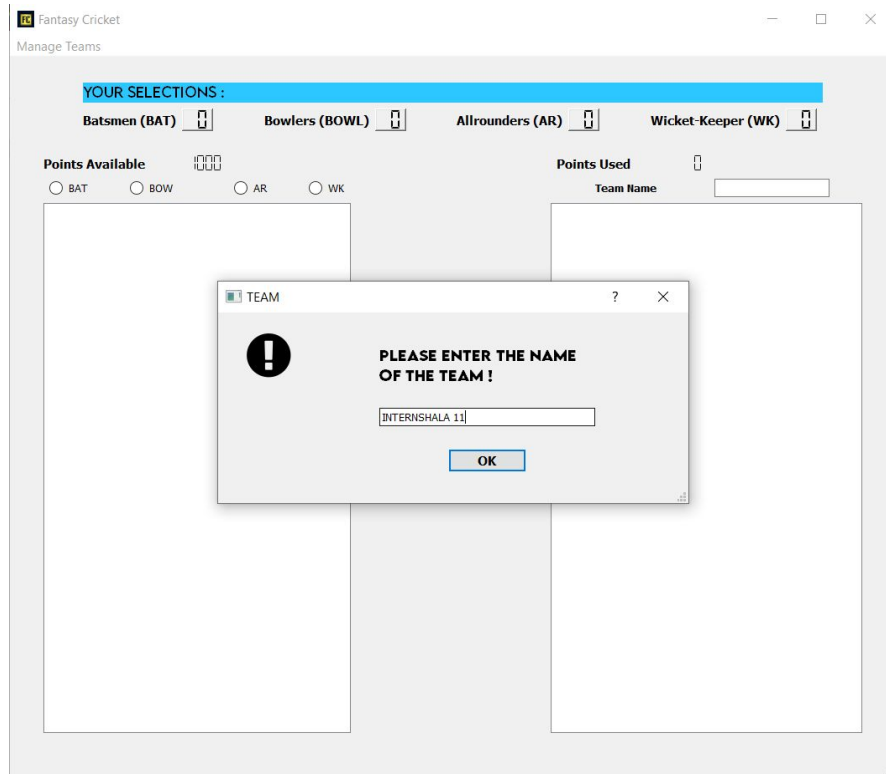

The window is initially disabled,only the menu - "Manage Teams" is enabled.

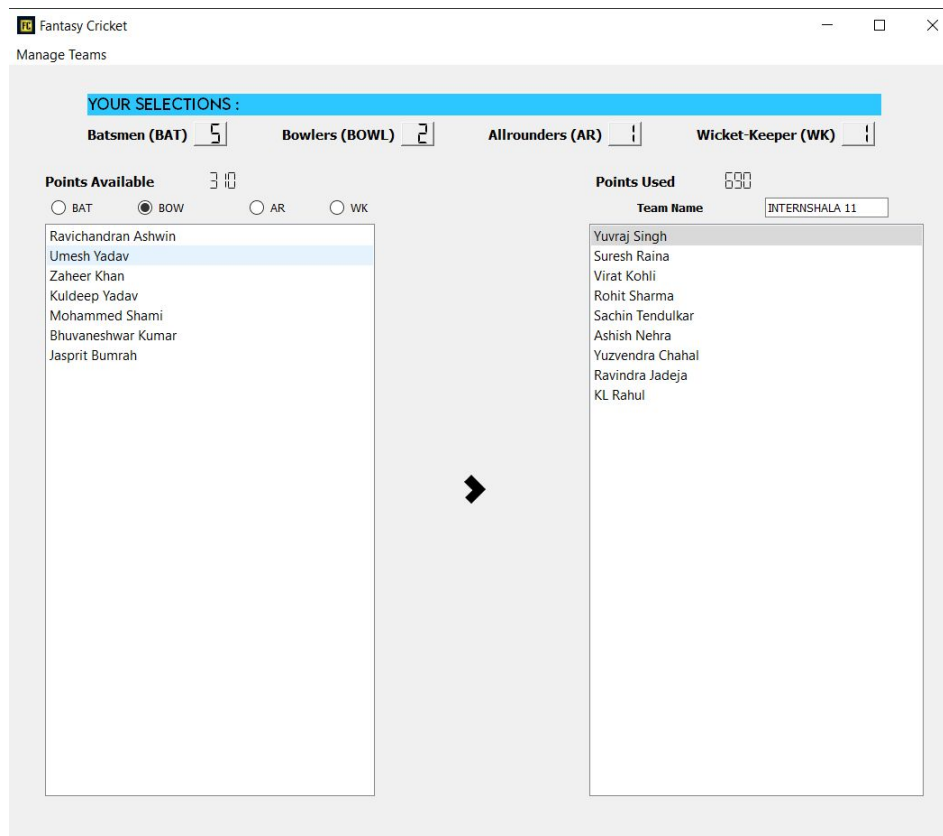2. On clicking Manage Teams , a menu pops-up.

From here Various options can be selected and further options will be thus provided

3.a. When the "New Team" option is Selected , a dialog pops up.

Now you can enter the name of your fantasy team and proceed to create your team

3.b. On clicking radio buttons , you can view players of different categories .
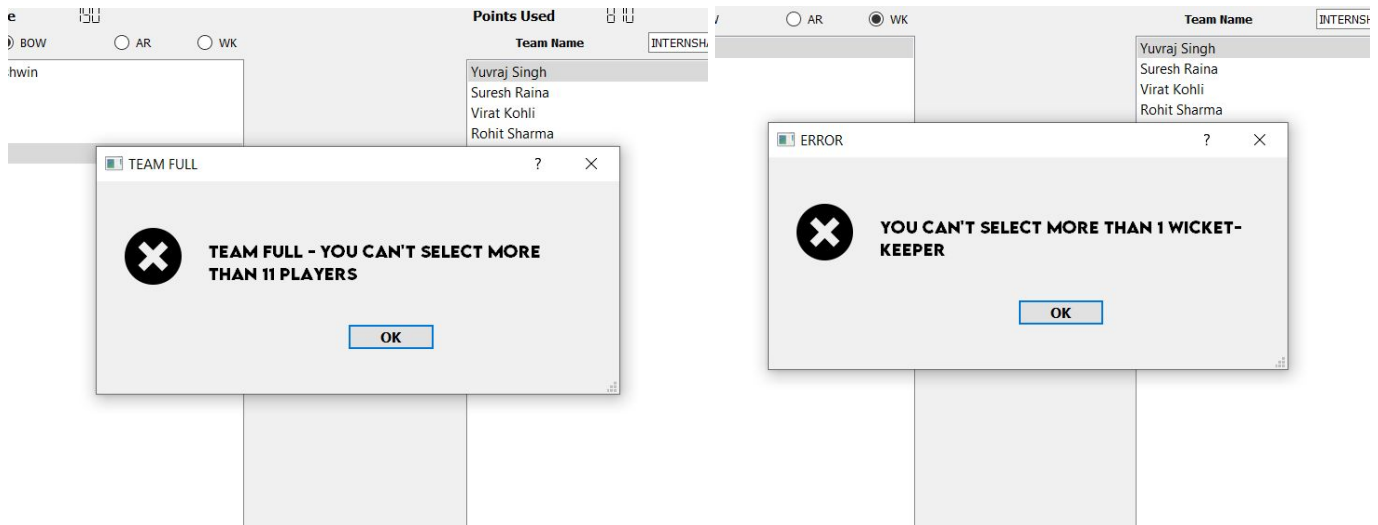

On double-clicking the players in available players list
*Also as players are selected points are cut from the "available" tally and are added into the "used" tally.*
And the counter of players also increases with respect to their category/specialization.

3.c. When Selection criteria is violated , error dialog appears.

Error messages are displayed when more than 11 players are added in the Selected players list or more than one wicket-keeper is selected.

4. When done with selecting players, You can save your team with the "Save Team" option in the "Manage Teams" menu.
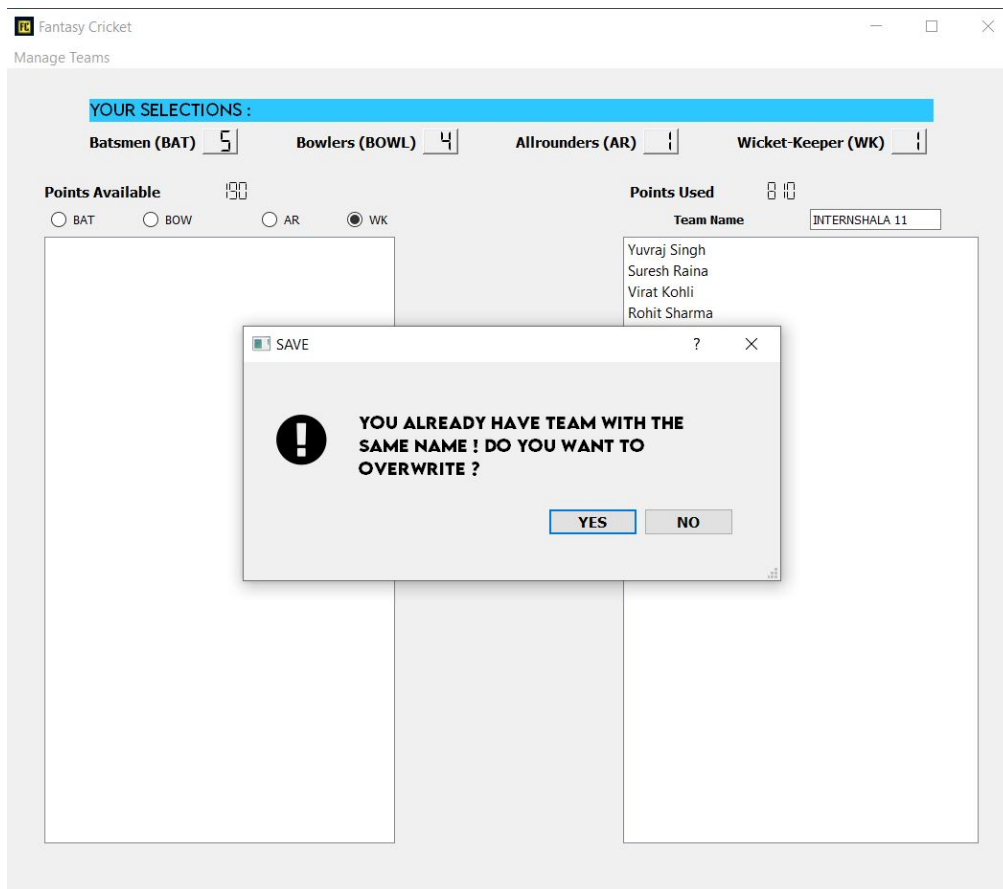
When saving the team with a name that is existing previously you get an error message. If you select "yes", then the record with that name will be updated . And if you select "No", then your team will not be saved until you change its name.
*This will enable you to always edit your team once it is saved.*

# 5. When "Open Team" option is selected in the "Manage Teams" menu.
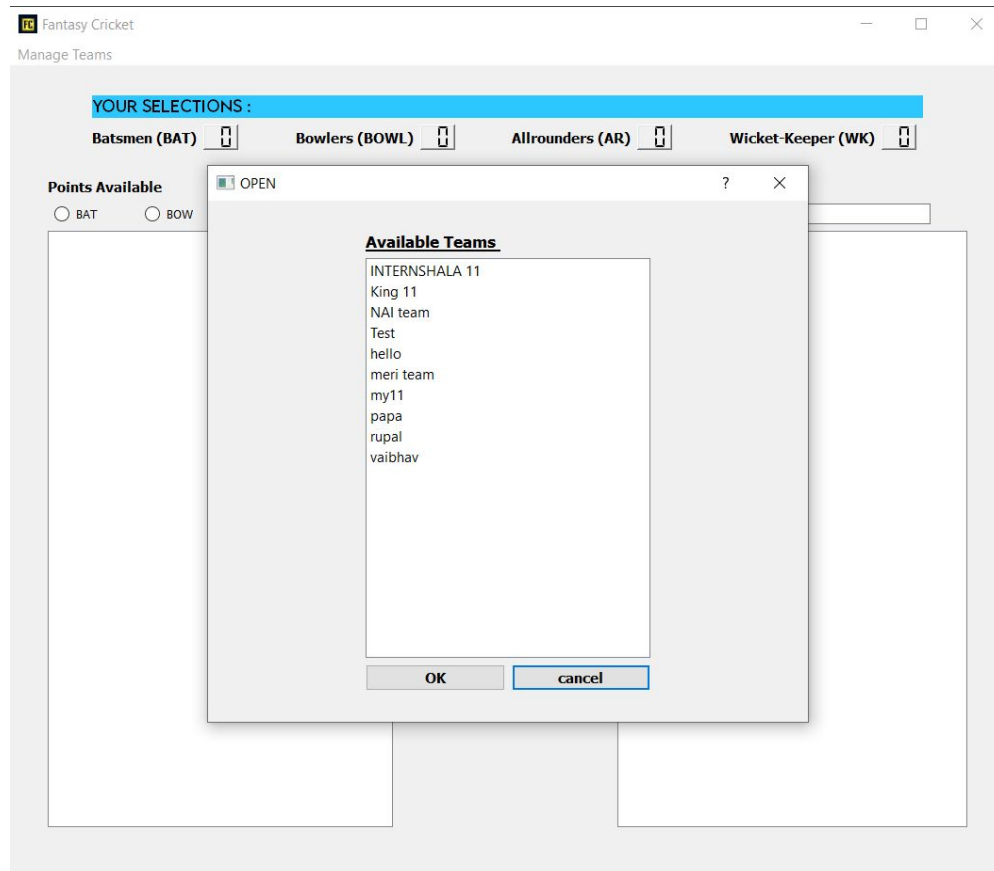
Here select your desired team and click OK. Your Selected team will appear in the "Selected Players" list, rest tallies will be automatically updated. After that , you can Edit your team and save changes.

# 6.a. When "Evaluate Team" option is selected in the menu.
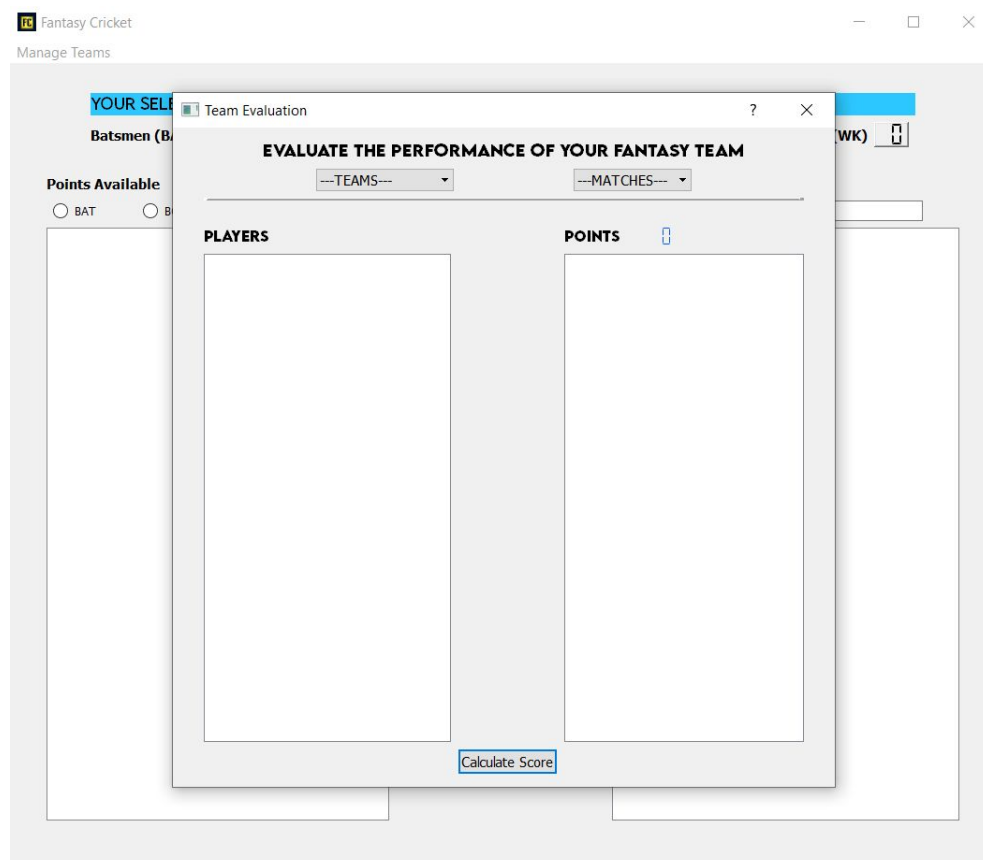
Here you can Choose your desired team and desired match and see the performance of each team against any desired match.

6.b. Error is Displayed When proper selection is not made.
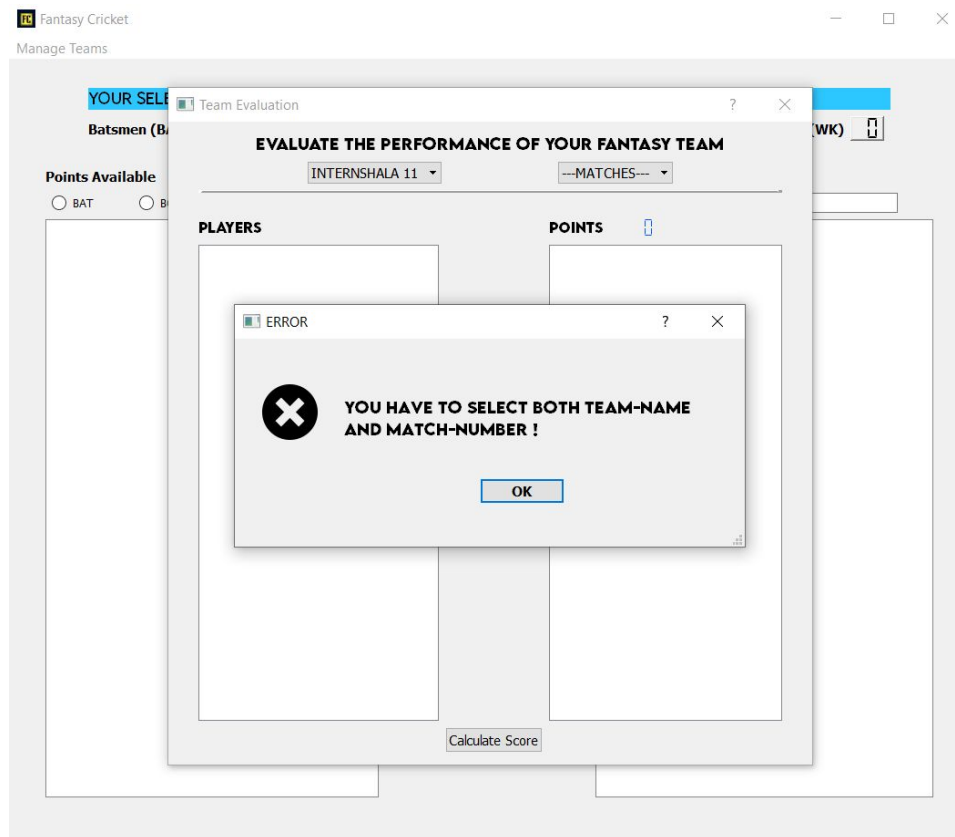
*When ONLY match is selected or ONLY Team name is selected, error is displayed.*

6.c. On clicking "Calculate score", after selecting match and Team.
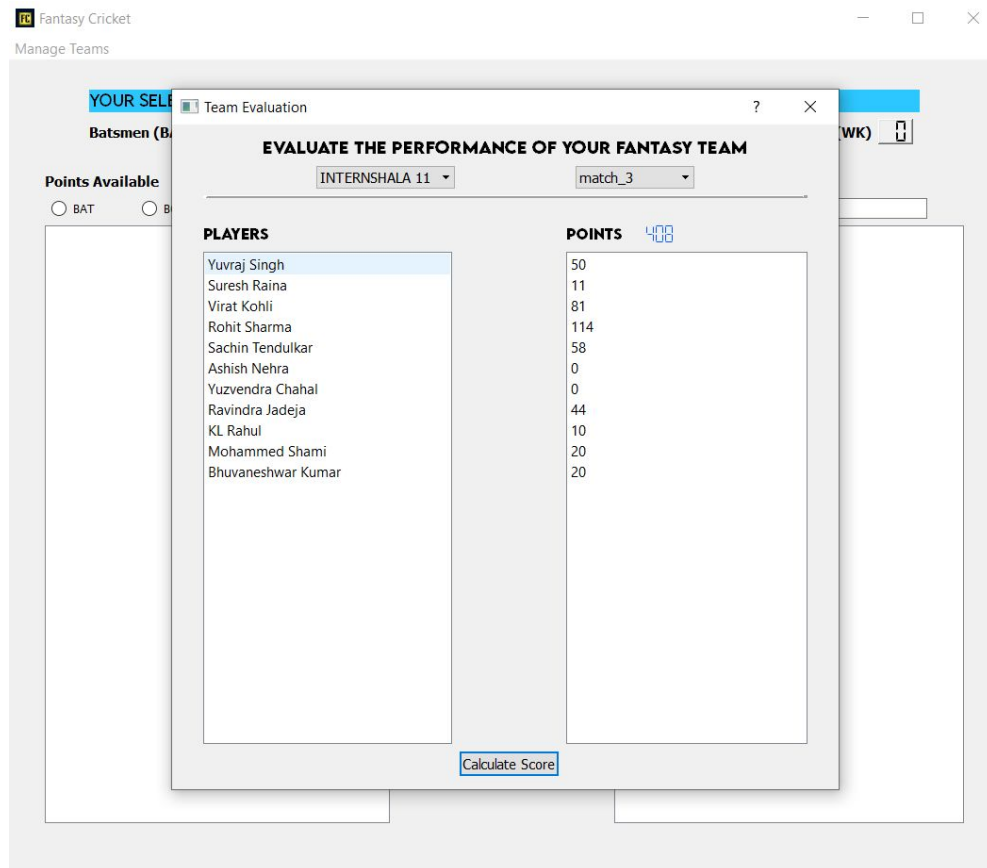
Both Lists are populated with values, list "Players" with the name of the players in the selected team and list "Points" with the score calculated of individual players according to the pre-defined rules. The total of all scores is displayed on the top.

7. When the "Quit" option is selected from the menu.
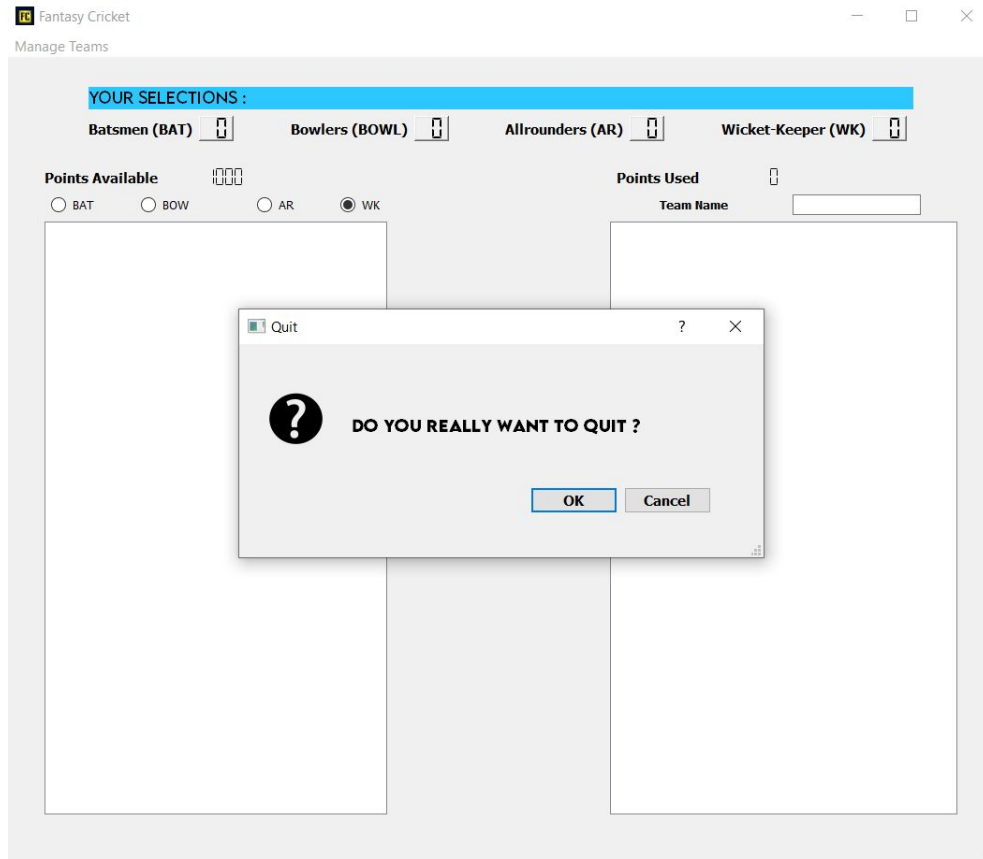
When exiting the application the Quit Dialog appears to confirm your action, clicking "OK" will close the application and cancel will bring you back. Make sure to Save your work before exiting.

Conclusion :

From the programming point of view, the project helped to understand the use of Graphic user Interface with Database, both connected by Python Programming.

From a developer point of view, this project helped to learn how to manage and plan work, how to develop an interacting Graphic-computer application. It helps to imbibe a deep understanding of how a project is developed, from planning, executing and testing it.

Future Developments :

There is always scope for developments, in this project too there are lots of room for improvements.

As this application only works with the data which have been previously stored in SQLite database, it could be made more Generalized, fetching data from sites solely dedicated to cricketing stats, like "www.espncricinfo.com" or "www.cricbuzz.com" . This will give this Fantasy Cricket application more coverage of players and series. And users will have more real-life experience.

There could also be an addition to make this game operate online, enabling a user to login into the application so that user specific data is stored on an individual device, and the whole system connected to a central server.

Also by adding a reward system for users whenever their team performs well on pre-defined rules, this will encourage them to construct a better team always, keeping in mind previous performances and various stats. Application should also contain information about the ground, pitch , weather conditions , all this will enable a user to choose the players wisely.

<u>References :</u>

(The Executable file in this project couldn't be included in Zip file.To get the executable File of this Project , Please Click Here - https://drive.google.com/drive/folders/18nz5JXfmPZh_uz1Kb1W-rHnfyy msJtkF?usp=sharing)

1. **<u>Programming With Python</u> by Internshala**- All of my knowledge and learning which enabled me to build this project came from this online training. It taught me Python , SQL and I learnt to use Qt Designer from this only.
   The internshala course **Programming with Python** was designed so well, that I have been able to successfully implement each and every concept in this project. Also the facility to ask Doubts in Forum proved to be of immense value, all of them were answered within 24 hours, and it ensured my learning was never hindered.

2. https://sqlitestudio.pl/

3. https://forum.qt.io/topic

4. https://build-system.fman.io/qt-designer-download

5. https://en.wikipedia.org/wiki

6. https://www.youtube.com/watch?v=fcfkNRzkLbM

7. https://www.youtube.com/watch?v=UZX5kH72Yx4&list=LL0S_Af2s Y7JIPJSqNxFo52w&index=2&t=0s

8. http://girfahelp.blogspot.com/2015/12/synopsis-computer-science-pr oject.html

9. https://trainings.internshala.com/progress/home/python

10. https://stackoverflow.com/questions