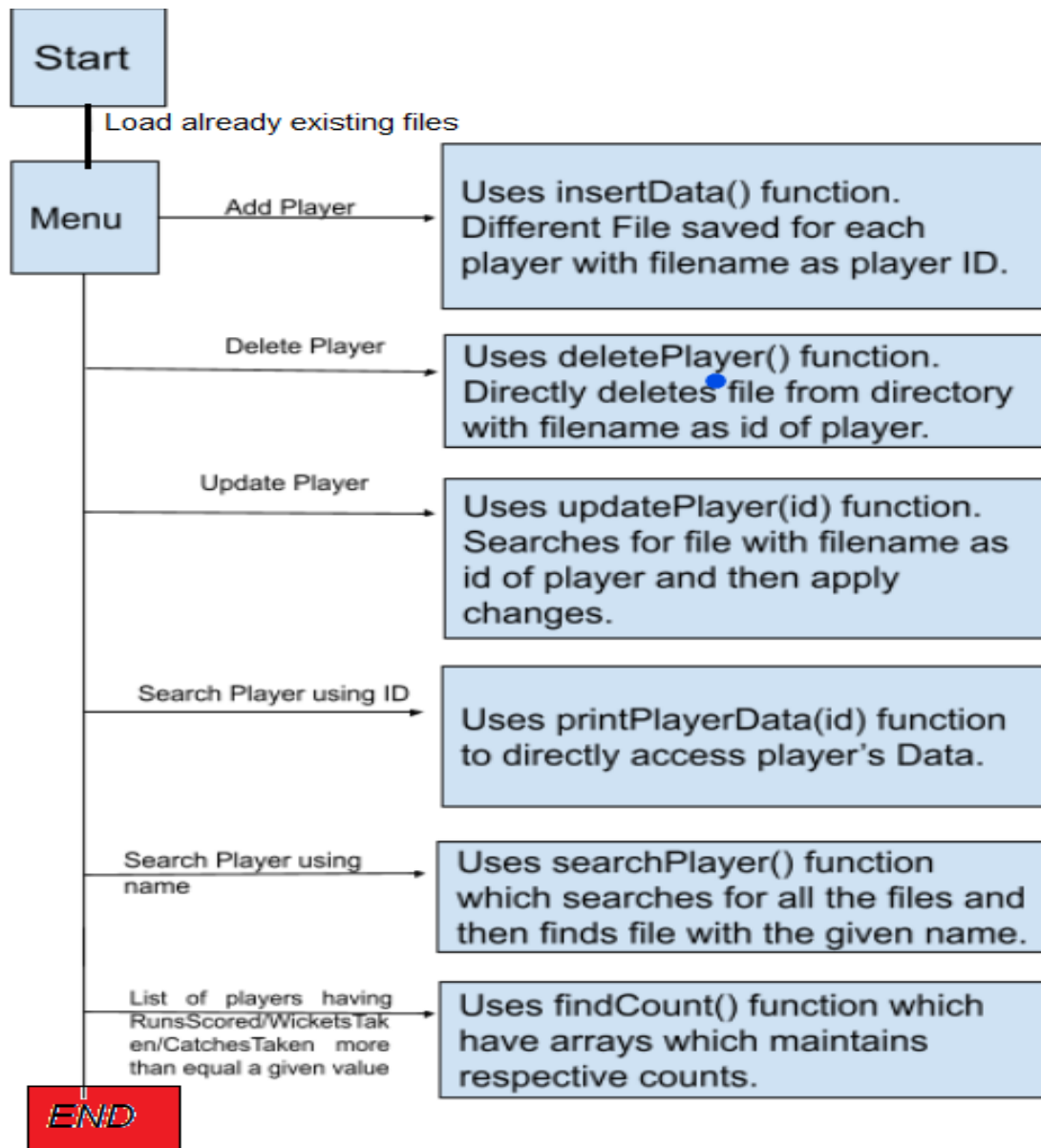**Abhishek Jangid**
2111CS01
CS515 Assign 5

Time Complexities of operations:-
  1. Add a player record : O(1)
  2. Delete a player record : O(1)
  3. Update a player record : O(1)
  4. Search for information of player using playerID : O(1)
  5. Search for information of player using name : O(N)
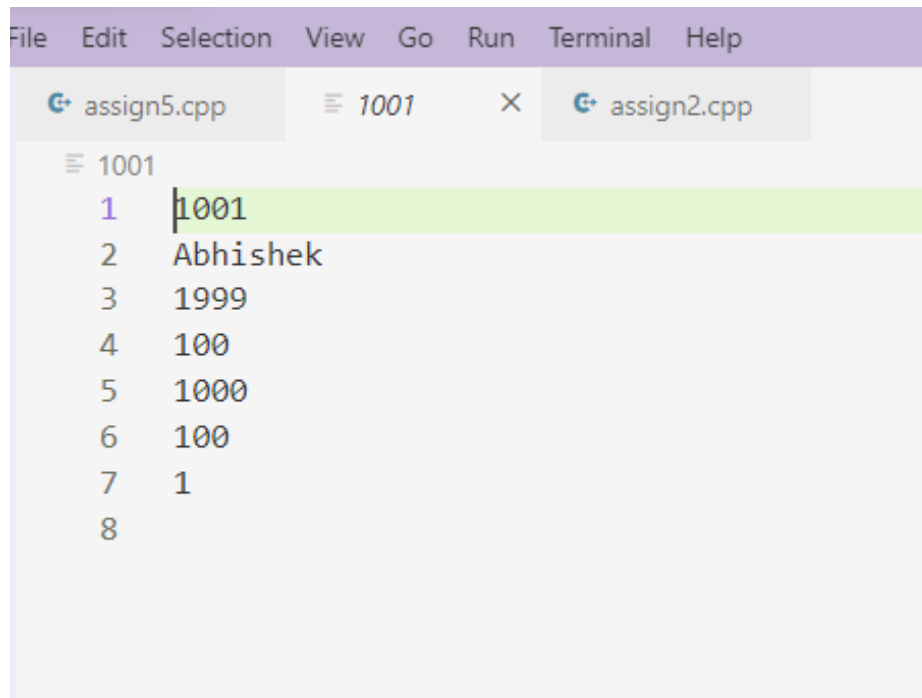 6. List of players having RunsScored/WicketsTaken/CatchesTaken more than equal a given value : O(1)

Flow Diagram:

Files for storing data:

Each file contains 7 fields.

1. Player ID.
2. Player Name.
3. Birth Year.
4. Matches Played.
5. Runs scored.
6. Wickets Taken.
7. Catches Taken.

Whenever the assign5.cpp files gets executed all these players files are getting read so that we can load the data stored in them.

Indexing for faster retrieval of info:

We are maintaining 3 arrays totalruns, totalcatches and wickets which store the count of players who have statistics more than a particular value.(Value is used as a index in this)

When we insert, load or update the database, we make changes in these arrays on that particular time itself because of this we don't have to search explicitly for the count.

All these retrievals of info are getting done in O(1) time by using these arrays.

Operations:

1. **Add a player**:-
   - User enters the required data.
   - Program checks if the player id is already present or the player id is not 4 digits.

```
1. Add a player record  ●
2. Delete a player record
3. Update a player record
4. Search for information of player using playerID
5. Search for information of player using name
6. List of players having RunsScored/WicketsTaken/CatchesTaken more than equal a given value
7. Exit
1
Enter Player ID of Player 1005
Enter Name of Player Anmol
Enter Birth Year of Player 1998
Enter matches played by Player 1000
Enter Runs scored by Player 1005
Enter wickets taken by player 105
Enter catches taken by player 4
Player added successfully
```

2. **Delete a player**:-
   - User enters the player id who he/she wants to delete.
   - Data of that player is getting deleted and the existing file for that player is also getting deleted.

```
1. Add a player record
2. Delete a player record
3. Update a player record
4. Search for information of player using playerID        ●
3. Update a player record
4. Search for information of player using playerID
5. Search for information of player using name
6. List of players having RunsScored/WicketsTaken/CatchesTaken more than equal a given value
7. Exit
2
Enter PlayerId 1002
Data deleted successfully
```

3. **Update a player**:-
   - User enters the player id of the player whose data he wanted to change.
   - We get some choices. After picking a choice data gets updated.

```
3. Update a player record
4. Search for information of player using playerID
5. Search for information of player using name
6. List of players having RunsScored/WicketsTaken/CatchesTaken more than equal a given value
7. Exit
3
Enter id of the player 1
Player doesn't exists.

1. Add a player record
2. Delete a player record
3. Update a player record
4. Search for information of player using playerID
5. Search for information of player using name
6. List of players having RunsScored/WicketsTaken/CatchesTaken more than equal a given value
7. Exit
3                                                               ●

Select a choice
1. Change Name
2. Change Birth Year
3. Change matches played
4. Change runs
5. Change wickets taken
6. Change catches taken
7. Exit 7
Chnages updated successfully.
ID of player is 1001
Name of player is Abhishek
Birth year of player is 1999
Matches played by player are 100
runs score by player are 1000
wickets taken by player are 100
catches taken score by player are 1
```

4. **Search player by ID**:-
   - User enters player id.
   - Program take only constant time to find the player's details.

```
1. Add a player record
2. Delete a player record
3. Update a player record
4. Search for information of player using playerID
5. Search for information of player using name
6. List of players having RunsScored/WicketsTaken/CatchesTaken more than equal a given value
7. Exit
4
Enter player id to search 1001
ID of player is 1001
Name of player is Abhishek
Birth year of player is 1999
Matches played by player are 100
runs score by player are 1000
wickets taken by player are 100
catches taken score by player are 1
```

5. **Search player by name**:-
   - User enters player id.
   - Program searches all the players and find player with that name.

```
Enter name of a player to search
Abhi
Player not found.
Please enter correct player name.
```

```
Enter name of a player to search
Abhishek
ID of player is 1001
Name of player is Abhishek
Birth year of player is 1999
Matches played by player are 100
runs score by player are 1000
wickets taken by player are 100
catches taken score by player are 1
```

6. **List of players having RunsScored/WicketsTaken/CatchesTaken more than equal a given value:-**
   - User enters a value.
   - Programs use this value as an index and prints the value presented at this index.

```
1. Add a player record
2. Delete a player record
3. Update a player record
4. Search for information of player using playerID
5. Search for information of player using name
6. List of players having RunsScored/WicketsTaken/CatchesTaken more than equal a given value
7. Exit
6                                                      ●
Enter a choice
1. Runs Scored
2. Wickets Taken
3. Catches Taken
1
Enter value 100
No of players with runs more than 100 are 2
```

```
1. Add a player record
2. Delete a player record
3. Update a player record
4. Search for information of player using playerID
5. Search for information of player using name
6. List of players having RunsScored/WicketsTaken/CatchesTaken more than equal a given value
7. Exit
6
Enter a choice
1. Runs Scored
2. Wickets Taken
3. Catches Taken
2
Enter value 20
No of players with wickets more than 20 are 1
```

```
1. Add a player record
2. Delete a player record
3. Update a player record
4. Search for information of player using playerID
5. Search for information of player using name
6. List of players having RunsScored/WicketsTaken/CatchesTaken more than equal a given value
7. Exit
6
Enter a choice
1. Runs Scored
2. Wickets Taken
3. Catches Taken
3
Enter value 1
No of players with catches more than 1 are 2
```