



Jordan University of Science and Technology
Faculty of Computer and Information Technology
Department of Computer Science
CS113 – Final Project

Instructions:

- You should separate the class to .h and .cpp files, otherwise **10** grades will be **deducted** from the total mark (50).
- Cheating → your grade = 0.
- If a function is not working correctly → function grade = 0 (**on/off**)



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Write a C++ program that declares and implements the **Player**, **Coach**, **Team** and **FootballTeam** classes by building a suitable relation between them.

Player

```
- playerName: string
- playerId: int
- status: char

+ setAll(string, int, char): void
+ getPlayerName(): string
+ getPlayerID(): int
+ setStatus(char): void
+ getStatus(): char
+ print(): void
+ Player(string = "", int = 0, char = 'i');
```

Coach

```
- coachName: string
- coachID: int

+ setAll(string, int): void
+ getAll(string&, int&): void
+ Coach(string, int)
```



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Team

```
- teamName: string
# teamCoach: Coach
+ setAll(string, string, int): void
+ setTeamName(string): void
+ getTeamName(): string
+ print() = 0: void
+ Team(string, string, int)
```

FootballTeam

```
- players: Player*
- points: int
- count: int
- maxPlayers: int
+ FootballTeam(const FootballTeam&)
+ updatePoints(int): void
+ getNumberOfPoints(): int
+ getCount(): int
+ addPlayer(string, int, char): void
+ removePlayer(int): void
+ retrievePlayerHasNumber(int): string
+ retrievePlayers(char): Player*
+ operator==(FootballTeam&): bool
+ moreNumberOfPoints(FootballTeam*): FootballTeam
+ ~FootballTeam()
```



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Function Members of **Player** Class:

- **setAll**: set `playerName`, `playerID`, and `status` according to the parameters.
- **getPlayerName**: retrieve the value of `playerName` member variable.
- **getPlayerId**: retrieve the value of `playerID` member variable.
- **setStatus**: set `status` according to the parameters.
- **getStatus**: retrieve the `status` member variable.
- **print**: output `playerID` and `playerName`. (**Note**: use tab space between them).
- **Constructor**: to initialize all data members for any new **Player** object.

Function Members of **Coach** Class:

- **setAll**: set `coachName` and `coachID` according to the parameters.
- **getAll**: return the `coachName` and `coachID` member variables by saving them in the parameters.
- **Constructor**: initialize all data members for any new **Coach** object.

Function Members of **Team** Class:

- **setAll**: set `teamName`, `coachName` and `coachID` according to the parameters.
- **setTeamName**: set `teamName` according to the parameters.
- **getTeamName**: retrieve the `teamName` member variable.
- **print**: pure virtual function to output `teamName`, `coachName` and `playerID` and `playerName` for all players in the derived class.
Note: implement print function as private function in the derived class.
- **Constructor**: initialize all data members for any new **Team** object.



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Function Members of **FootballTeam** Class:

- **Constructor**: initialize all data members for any new **FootballTeam** object.
 - **Copy Constructor**: initialize the caller object with the data of the parameter object.
 - **updatePoints**: increase the points of the team by the value of the parameter. 🖐️
 - **getNumberOfPoints**: retrieve the value of `points` member variable.
 - **getCount**: retrieve the value of `count` member variable.
 - **addPlayer**: add new player to the team as follows:
 - If the players list is full, print "You exceeded the max number of players."
 - Otherwise, add the new player to the players list.
 - Check duplicate id; do not add any two players with the same id.
 - If the user enters an exist id, ask him to enter new id. "Please choose other ID."
- Note**: the character variable in the parameter list will be 'a' for active player and 'i' for inactive player.
- **removePlayer**: remove the player with the given id from the team. If the id is not in the players list print "The player is not found in the players list."
 - **retrievePlayerHasNumber**: retrieve the player name that has the given id in the parameter.
 - **retrievePlayers**: retrieve a dynamic array of players that status equal to the given parameter.
If the parameter is equal to 'a' then retrieve the **active** players in the team, otherwise if the parameter is equal to 'i' then retrieve the **inactive** players in the team
 - **operator==**: check whether a two teams have the same number of players.
 - **moreNumberOfPoints**: return the team (caller or parameter) that has the more points.
 - **Destructor**: deallocate the dynamic allocation.



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Non-member Function:

- **getActivePlayersName**: print the player's id and name of all players in the team with status equal to the character parameter.
- **printTeamInfo**: accepts a pointer of Team class as a parameter. The function should output the parameter information.

main Function:

Complete the given main:

```
int main() {  
    //1. Create a dynamic object of FootballTeam class with the following values:  
    "Manchester City", "Guardiola", 32, 123, 50  
  
    //2. Create a dynamic object of FootballTeam class with the following values:  
    "Barcelona", "Xavi", 37, 21, 75  
  
    manCity->addPlayer("Riyad Mahrez", 26, 'a');  
    manCity->addPlayer("Julian Alvarez", 19, 'a');  
    manCity->addPlayer("Erling Haaland", 9, 'a');  
    manCity->addPlayer("Bernardo Silva", 20, 'i');  
    manCity->addPlayer("Jack Grealish", 10, 'i');  
    manCity->addPlayer("Kevin De Bruyne", 17, 'a');  
    manCity->addPlayer("Kyle Walker", 2, 'i');  
  
    barcelona->addPlayer("Marcos Alonso", 17, 'i');  
    barcelona->addPlayer("Jordi Alba", 18, 'a');  
    barcelona->addPlayer("Eric García", 25, 'a');  
    barcelona->addPlayer("Sergio Busquets", 5, 'i');  
    barcelona->addPlayer("Frenkie de Jong", 21, 'a');  
    barcelona->addPlayer("Ousmane Dembélé", 7, 'a');  
    barcelona->addPlayer("Ansu Fati", 10, 'a');  
    barcelona->addPlayer("Memphis Depay", 14, 'a');  
  
    int choice;  
    do {  
        cout << "***** Menu  
*****\n";  
        cout << "Enter 1: to add a player.\n"  
            << "Enter 2: to remove a player.\n"  
            << "Enter 3: to update points.\n"  
            << "Enter 4: to display teams points.\n"
```



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```
<< "Enter 5: to print the team's name that has more points.\n"
<< "Enter 6: to check whether the two teams have the same number of players.\n"
<< "Enter 7: to display team info (team name, coach and players).\n"
<< "Enter 8: to display active players.\n"
<< "Press any Key to EXIT.\n";
cout << "*****\n";
cin >> choice;

switch (choice) {
    int c;
    //*****Add Player*****
    case 1:
    {
        cout << "Enter 1 to add a player to Manchester City, or\n"
                << "Enter 2 to add a player to Barcelona.\n";
        int num;
        string name;
        char s;
        cin >> c;
        cout << "Enter player name, number and status (a: active or i:
inactive).\n";
        cin >> name >> num >> s;
        switch (c) {
            case 1:
                //3. Add the player to Man. City team.

                cout << "Added... " << name << endl << endl;
                break;
            case 2:
                //4. Add the player to Barcelona team.

                cout << "Added... " << name << endl << endl;
                break;
        }
        break;
    }

    //*****Remove Player*****
    case 2:
    {
        cout << "Enter 1 to remove a player from Manchester City, or\n"
                << "Enter 2 to remove a player from Barcelona.\n";
        cin >> c;
        int num;
        cout << "\nEnter the player number you want to remove... ";
```



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```
cin >> num;
switch (c) {
case 1:
//5. Print the player's name you want to remove from Man. City team
    then remove the player from the team.

    break;
case 2:
//6. Print the player's name you want to remove from Barcelona team
    then remove the player from the team.

    break;
}
break;
}

//*****Update Points*****
case 3:
{
    cout << "Enter 1 to update the points for Manchester City, or\n"
        << "Enter 2 to update the points for Barcelona.\n";
    cin >> c;
    int p;
    cout << "Enter the new point the Team has earned... ";
    cin >> p;
    if (c == 1) {
//7. Update the points for Man. City team.

        cout << "Updated...\n\n";
    }
    else {
//8. Update the points for Barcelona team.

        cout << "Updated...\n\n";
    }
    break;
}

//*****Display Points*****
case 4:
{
//9. Display the points for Man. City and Barcelona teams as in the sample output.

    break;
}
```




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```
//*****More Points*****  
case 5:  
{  
//10. Display the team's name that has more points.  
  
    break;  
}  
  
//*****Same #Players*****  
case 6:  
{  
//11. Check whether the two teams have the same number of players.  
  
    break;  
}  
//*****Display Team Info*****  
case 7:  
{  
    cout << "Enter 1 to display Manchester City team info, or\n"  
        << "Enter 2 to display Barcelona team info.\n";  
    cin >> c;  
    if (c == 1) {  
        //12. Display Man. City team info.  
  
        cout << endl;  
    }  
    else {  
        //13. Display Barcelona team info.  
  
        cout << endl;  
    }  
    break;  
}  
case 8:  
{  
    cout << "Enter 1 to display active players in Manchester City team, or\n"  
        << "Enter 2 to display active players in Barcelona team.\n";  
    cin >> c;  
    if (c == 1) {  
        //14. Display player's id and name of all active players in Man. City team.  
        cout << endl;  
    }  
    else {  
        //15. Display player's id and name of all active players in Barcelona team.  
        cout << endl;  
    }  
}
```



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```
}  
break;  
}  
}  
} while (choice >= 1 && choice <= 7);  
return 0;  
}
```

Sample Run:

Menu-Driven of our Project

```
C:\Users\bfmat\OneDrive\Desktop\desktop\Material\CS113\22-23 First\Project\Final Project\Debug\Final Project.exe  
***** Menu *****  
Enter 1: to add a player.  
Enter 2: to remove a player.  
Enter 3: to update points.  
Enter 4: to display teams points.  
Enter 5: to print the team name that has more points.  
Enter 6: to check whether the two teams have the same number of players.  
Enter 7: to display team info (team name, coach and players).  
Press any Key to EXIT.  
*****
```

1. Add player steps:

```
C:\Users\bfmat\OneDrive\Desktop\desktop\Material\CS113\22-23 First\Project\Final Project\Debug\Final Project.exe  
***** Menu *****  
Enter 1: to add a player.  
Enter 2: to remove a player.  
Enter 3: to update points.  
Enter 4: to display teams points.  
Enter 5: to print the team name that has more points.  
Enter 6: to check whether the two teams have the same number of players.  
Enter 7: to display team info (team name, coach and players).  
Press any Key to EXIT.  
*****  
1  
Enter 1 to add a player to Manchester City, or  
Enter 2 to add a player to Barcelona.
```



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C:\Users\bfmat\OneDrive\Desktop\desktop\Material\CS113\22-23 First\Project\Final Project\Debug\Final Project.exe

```
***** Menu *****
Enter 1: to add a player.
Enter 2: to remove a player.
Enter 3: to update points.
Enter 4: to display teams points.
Enter 5: to print the team name that has more points.
Enter 6: to check whether the two teams have the same number of players.
Enter 7: to display team info (team name, coach and players).
Press any Key to EXIT.
*****
1
Enter 1 to add a player to Manchester City, or
Enter 2 to add a player to Barcelona.
2
Enter player number, status (a: active or i: inactive) and player name.
```

C:\Users\bfmat\OneDrive\Desktop\desktop\Material\CS113\22-23 First\Project\Final Project\Debug\Final Project.exe

```
***** Menu *****
Enter 1: to add a player.
Enter 2: to remove a player.
Enter 3: to update points.
Enter 4: to display teams points.
Enter 5: to print the team name that has more points.
Enter 6: to check whether the two teams have the same number of players.
Enter 7: to display team info (team name, coach and players).
Press any Key to EXIT.
*****
1
Enter 1 to add a player to Manchester City, or
Enter 2 to add a player to Barcelona.
2
Enter player number, status (a: active or i: inactive) and player name.
1 a ter stegen
Added... ter stegen
```

```
***** Menu *****
Enter 1: to add a player.
Enter 2: to remove a player.
Enter 3: to update points.
Enter 4: to display teams points.
Enter 5: to print the team name that has more points.
Enter 6: to check whether the two teams have the same number of players.
Enter 7: to display team info (team name, coach and players).
Press any Key to EXIT.
*****
```



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If the user enters a player number is reserved by another player:

```
C:\Users\bformat\OneDrive\Desktop\desktop\Material\CS113\22-23 First\Project\Final Project\Debug\Final Project.exe
***** Menu *****
Enter 1: to add a player.
Enter 2: to remove a player.
Enter 3: to update points.
Enter 4: to display teams points.
Enter 5: to print the team name that has more points.
Enter 6: to check whether the two teams have the same number of players.
Enter 7: to display team info (team name, coach and players).
Press any Key to EXIT.
*****
1
Enter 1 to add a player to Manchester City, or
Enter 2 to add a player to Barcelona.
2
Enter player number, status (a: active or i: inactive) and player name.
10 i Araujo
Please choose other ID.
```

```
C:\Users\bformat\OneDrive\Desktop\desktop\Material\CS113\22-23 First\Project\Final Project\Debug\Final Project.exe
Enter 1: to add a player.
Enter 2: to remove a player.
Enter 3: to update points.
Enter 4: to display teams points.
Enter 5: to print the team name that has more points.
Enter 6: to check whether the two teams have the same number of players.
Enter 7: to display team info (team name, coach and players).
Press any Key to EXIT.
*****
1
Enter 1 to add a player to Manchester City, or
Enter 2 to add a player to Barcelona.
2
Enter player number, status (a: active or i: inactive) and player name.
10 i Araujo
Please choose other ID.
23
Added... Araujo
```



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2. Remove player steps:

```
C:\Users\bformat\OneDrive\Desktop\desktop\Material\CS113\22-23 First\Project\Final Project\Debug\Final Project.exe
***** Menu *****
Enter 1: to add a player.
Enter 2: to remove a player.
Enter 3: to update points.
Enter 4: to display teams points.
Enter 5: to print the team name that has more points.
Enter 6: to check whether the two teams have the same number of players.
Enter 7: to display team info (team name, coach and players).
Press any Key to EXIT.
*****
2
Enter 1 to remove a player from Manchester City, or
Enter 2 to remove a player from Barcelona.
1
Enter the player number you want to remove...
```

```
C:\Users\bformat\OneDrive\Desktop\desktop\Material\CS113\22-23 First\Project\Final Project\Debug\Final Project.exe
***** Menu *****
Enter 1: to add a player.
Enter 2: to remove a player.
Enter 3: to update points.
Enter 4: to display teams points.
Enter 5: to print the team name that has more points.
Enter 6: to check whether the two teams have the same number of players.
Enter 7: to display team info (team name, coach and players).
Press any Key to EXIT.
*****
2
Enter 1 to remove a player from Manchester City, or
Enter 2 to remove a player from Barcelona.
1
Enter the player number you want to remove... 9
Removed... Erling Haaland
```



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If the user enters a player number is not in the players list:

```
C:\Users\bformat\OneDrive\Desktop\desktop\Material\CS113\22-23 First\Project\Final Project\Debug\Final Project.exe
***** Menu *****
Enter 1: to add a player.
Enter 2: to remove a player.
Enter 3: to update points.
Enter 4: to display teams points.
Enter 5: to print the team name that has more points.
Enter 6: to check whether the two teams have the same number of players.
Enter 7: to display team info (team name, coach and players).
Press any Key to EXIT.
*****
2
Enter 1 to remove a player from Manchester City, or
Enter 2 to remove a player from Barcelona.
1
Enter the player number you want to remove... 50
Removed...
The player is not found in the players list.
```

3. Update points:

```
C:\Users\bformat\OneDrive\Desktop\desktop\Material\CS113\22-23 First\Project\Final Project\Debug\Final Project.exe
***** Menu *****
Enter 1: to add a player.
Enter 2: to remove a player.
Enter 3: to update points.
Enter 4: to display teams points.
Enter 5: to print the team name that has more points.
Enter 6: to check whether the two teams have the same number of players.
Enter 7: to display team info (team name, coach and players).
Press any Key to EXIT.
*****
3
Enter 1 to update the points for Manchester City, or
Enter 2 to update the points for Barcelona.
1
Enter the new point the Team has earned... 3
Updated...
```



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4. Display points of a team:

```
C:\Users\bformat\OneDrive\Desktop\desktop\Material\CS113\22-23 First\Project\Final Project\Debug\Final Project.exe
***** Menu *****
Enter 1: to add a player.
Enter 2: to remove a player.
Enter 3: to update points.
Enter 4: to display teams points.
Enter 5: to print the team name that has more points.
Enter 6: to check whether the two teams have the same number of players.
Enter 7: to display team info (team name, coach and players).
Press any Key to EXIT.
*****
4
Points for:
Manchester City: 35
Barcelona: 37
```

5. Display the team that has more points:

```
C:\Users\bformat\OneDrive\Desktop\desktop\Material\CS113\22-23 First\Project\Final Project\Debug\Final Project.exe
***** Menu *****
Enter 1: to add a player.
Enter 2: to remove a player.
Enter 3: to update points.
Enter 4: to display teams points.
Enter 5: to print the team name that has more points.
Enter 6: to check whether the two teams have the same number of players.
Enter 7: to display team info (team name, coach and players).
Press any Key to EXIT.
*****
5
The team has more points is: Barcelona
```



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6. Check whether the two teams have the same number of players:

```
C:\Users\bfmat\OneDrive\Desktop\desktop\Material\CS113\22-23 First\Project\Final Project\Debug\Final Project.exe
***** Menu *****
Enter 1: to add a player.
Enter 2: to remove a player.
Enter 3: to update points.
Enter 4: to display teams points.
Enter 5: to print the team name that has more points.
Enter 6: to check whether the two teams have the same number of players.
Enter 7: to display team info (team name, coach and players).
Press any Key to EXIT.
*****
6
The two teams have not the same number of players.
```

7. Display team info:

```
C:\Users\bfmat\OneDrive\Desktop\desktop\Material\CS113\22-23 First\Project\Final Project\Debug\Final Project.exe
***** Menu *****
Enter 1: to add a player.
Enter 2: to remove a player.
Enter 3: to update points.
Enter 4: to display teams points.
Enter 5: to print the team name that has more points.
Enter 6: to check whether the two teams have the same number of players.
Enter 7: to display team info (team name, coach and players).
Press any Key to EXIT.
*****
7
Enter 1 to display Manchester City team info, or
Enter 2 to display Barcelona team info.
1
Team Name: Manchester City
Team Coach: Guardiola
Players:
26      Riyad Mahrez
19      Julian Alvarez
20      Bernardo Silva
10      Jack Grealish
17      Kevin De Bruyne
2       Kyle Walker
```




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8. Display active players:

```
C:\Users\bformat\OneDrive\Desktop\desktop\Material\CS113\22-23 First\Project\Final Project\Debug\Final Project.exe
***** Menu *****
Enter 1: to add a player.
Enter 2: to remove a player.
Enter 3: to update points.
Enter 4: to display teams points.
Enter 5: to print the team name that has more points.
Enter 6: to check whether the two teams have the same number of players.
Enter 7: to display team info (team name, coach and players).
Enter 8: to display active players.
Press any Key to EXIT.
*****
8
Enter 1 to display active players in Manchester City team, or
Enter 2 to display active players in Barcelona team.
1
26      Riyad Mahrez
19      Julian Alvarez
9       Erling Haaland
17      Kevin De Bruyne
```

Believe in yourself and make it happen 😊