Class Diagram for Cricinfo

Understand how to create a class diagram for Cricinfo using the bottom-up approach.

We'll cover the following

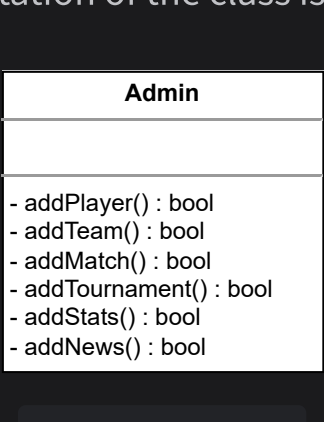
In this lesson, we'll identify and design the classes, abstract classes, and interfaces based on the requirements we have previously gathered from the interviewer in our Cricinfo system.

Components of Cricinfo

As mentioned earlier, we will design the Cricinfo system using a bottom-up approach.

Admin

The `Admin` class is responsible for managing the system as well as adding and modifying updates. The representation of the class is shown below:



The Admin class

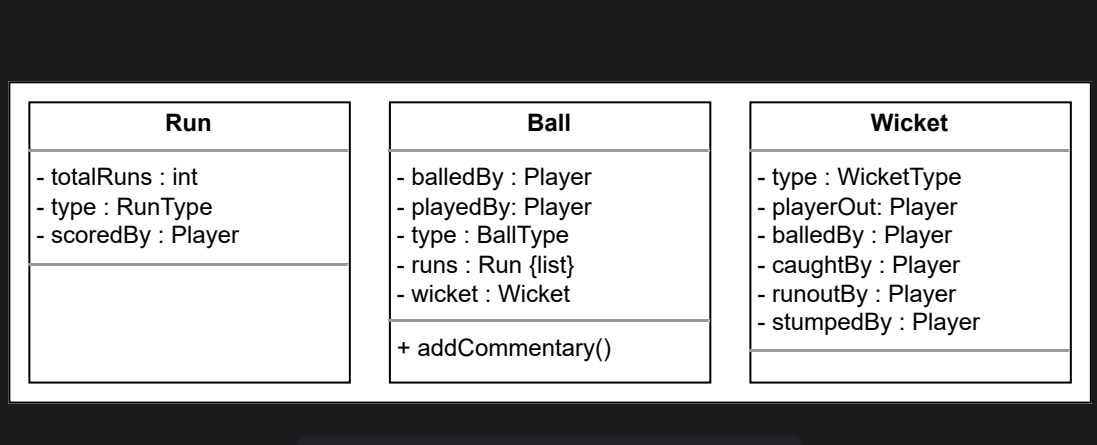
R8: Cricinfo

R8: The admin of the system should be able to add tournaments, matches, teams, players, and news to the system.

Run, ball, and wicket

The `Run` class records the number and type of runs scored on a ball. The `Ball` class records every detail of a ball, such as the number of runs scored, if it was a wicket-taking ball, etc. The `Wicket` class records the details of the wicket, including its type, the player that bowled, and the player that was declared out.

The mentioned classes are shown below:



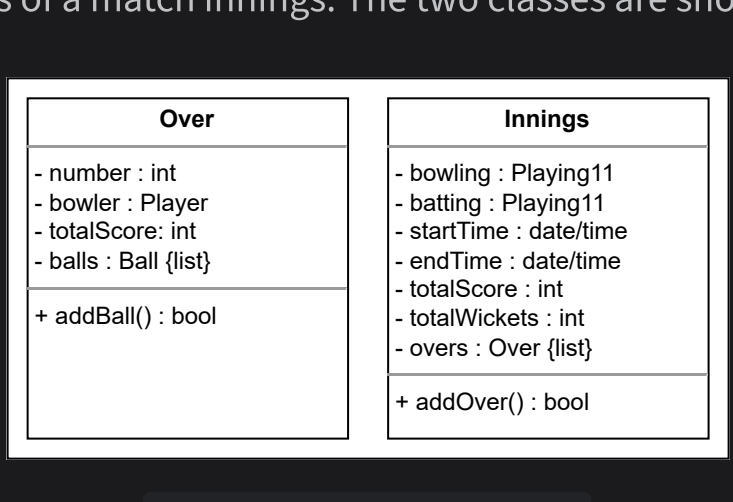
The Run, Ball, and Wicket classes

R2: Cricinfo

R2: The system should be able to track all scores or wickets that occurred for each ball. The system should also provide a live commentary for every ball.

Over and innings

The `Over` class represents all the details of an over of the innings. The `Innings` class represents the details of a match innings. The two classes are shown below:



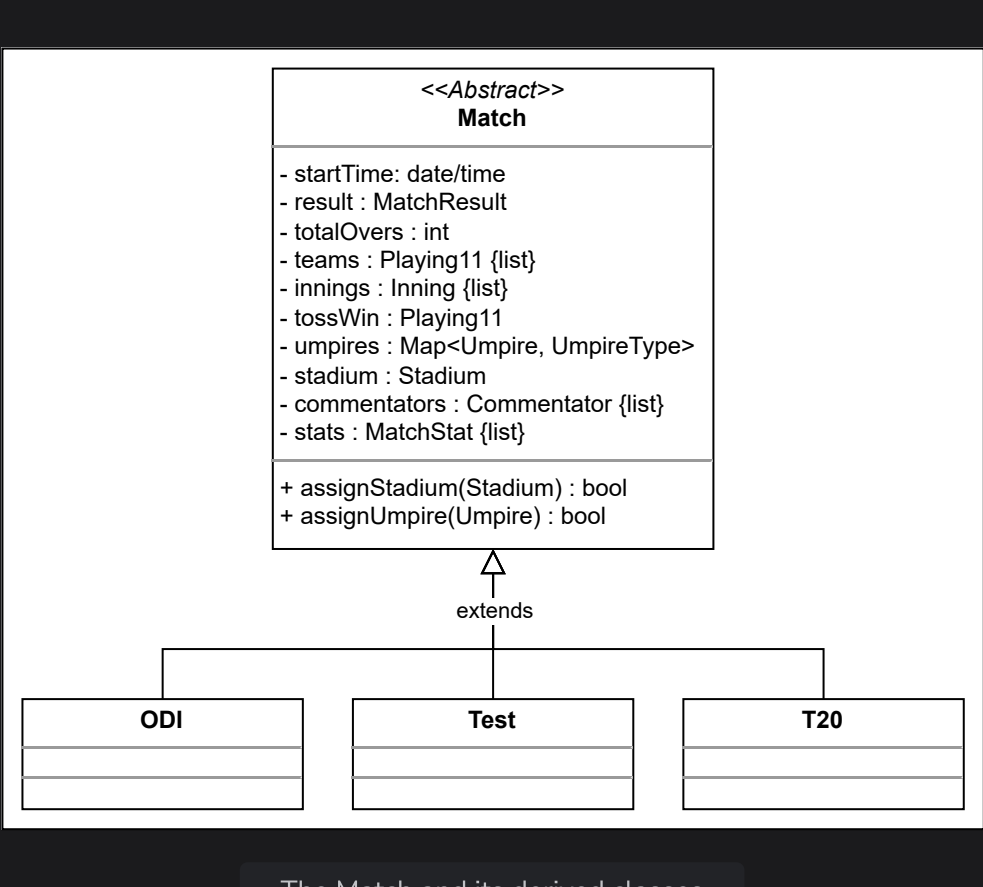
The Over and Innings classes

Match

The `Match` class is an abstract class that has three child classes that represent the types of matches that can take place.

- The `Test` class
- The `ODI` class
- The `T20` class

The class diagram is shown below:



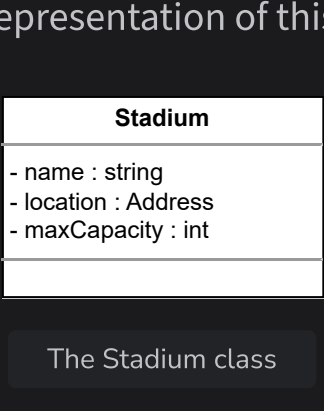
The Match and its derived classes

R3: Cricinfo

R3: The system should be able to keep track of all matches—Test, T20, and ODI matches.

Stadium

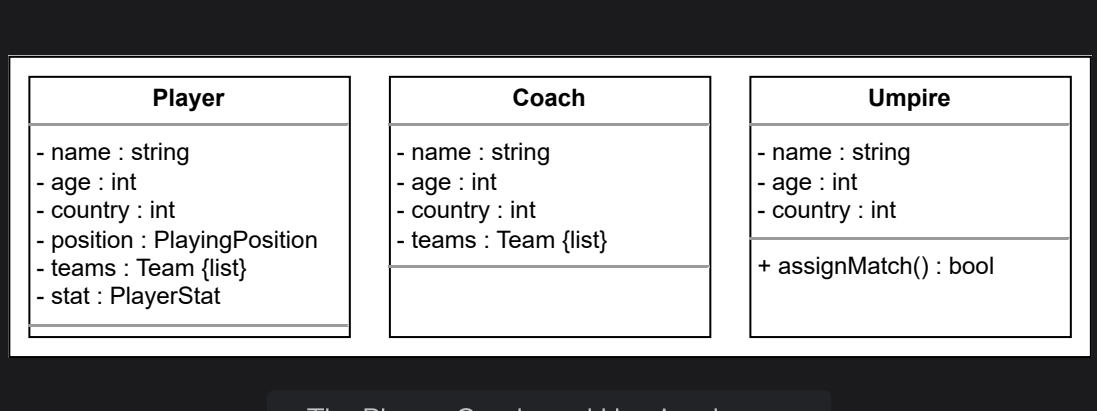
The `Stadium` class represents the information about a stadium, including its name, address, and capacity. The UML representation of this class is given below:



The Stadium class

Player, coach, and umpire

The `Player` class includes the information of a player and their statistics. The `Coach` class contains the information of a coach. The `Umpire` class contains the information of an umpire. The three classes are shown below:



The Player, Coach, and Umpire classes

R1: Cricinfo

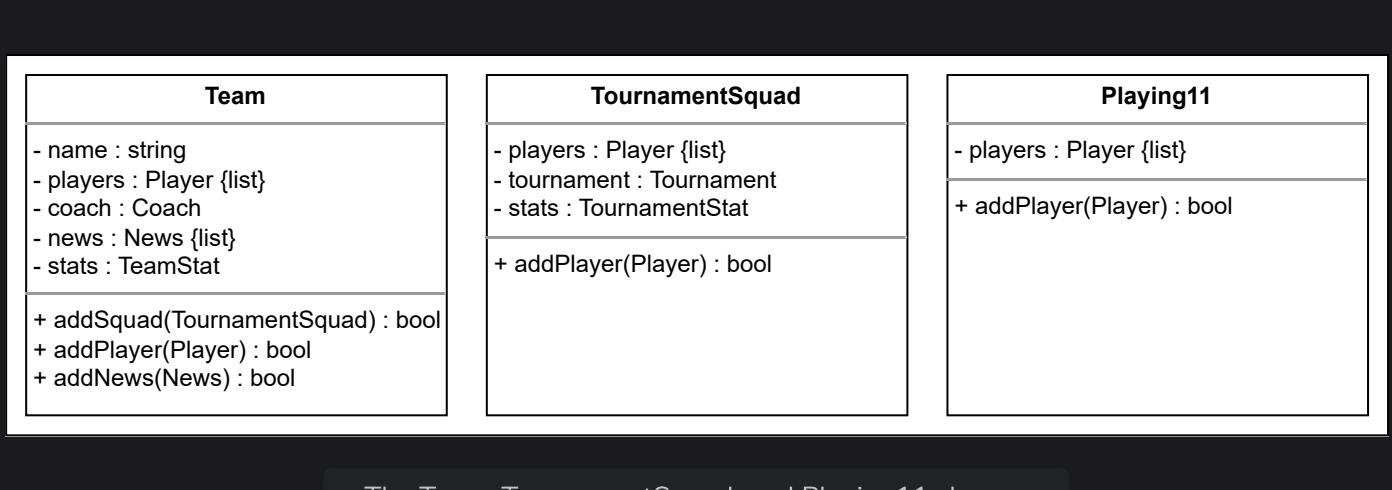
R1: The system should be able to track the stats of all players, teams, and matches.

Team, tournament squad, and playing eleven

The `Team` class represents the information about a cricket team, including the list of players, the team coach, and any news related to the team.

The `TournamentSquad` class represents the team members participating in a tournament. The `Playing11` class represents the squad members playing in a match.

The class diagram for these classes is given below:



The Team, TournamentSquad, and Playing11 classes

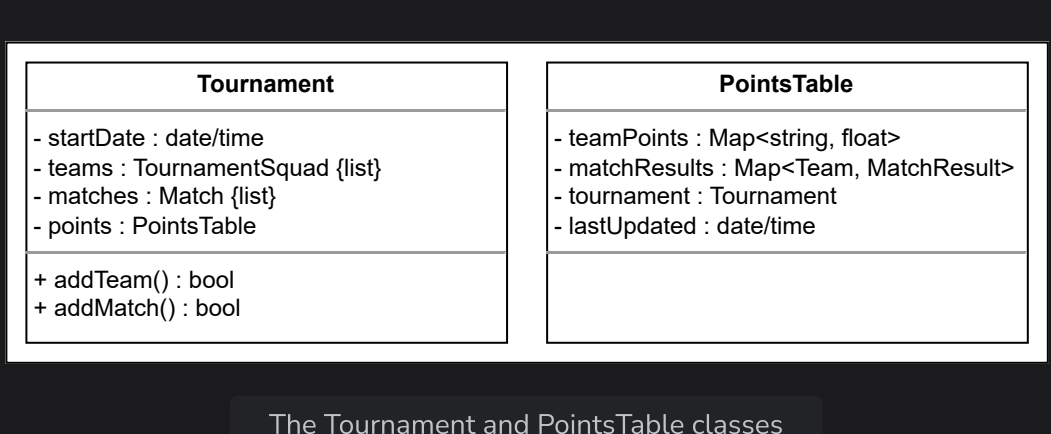
R6 and R7: Cricinfo

R6: All teams should be able to select some players that will participate in the tournament.

R7: For every match, the teams must select 11 players to play on the field, known as the playing eleven.

Tournament and points table

The `Tournament` class contains information about a cricket tournament. The `PointsTable` class shows the accumulated points and match results of the teams that play in the tournament. These classes are shown below:



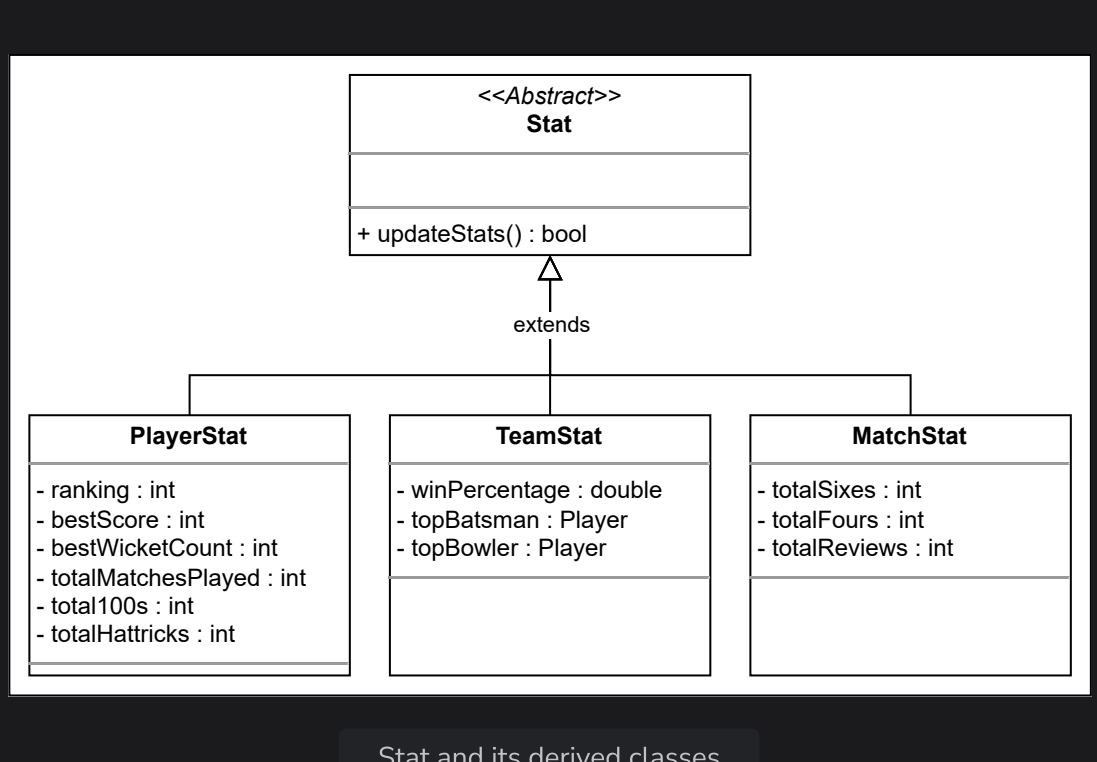
The Tournament and PointsTable classes

R4: Cricinfo

R4: The system should be able to keep track of ongoing and previous tournaments. The system should also be able to show a points table for all teams participating in a tournament.

Stats

The `Stat` class is an abstract class that extends to `PlayerStat`, `TeamStat`, and `MatchStat` classes. These classes contain important statistics. The UML representation is shown below:



Stat and its derived classes

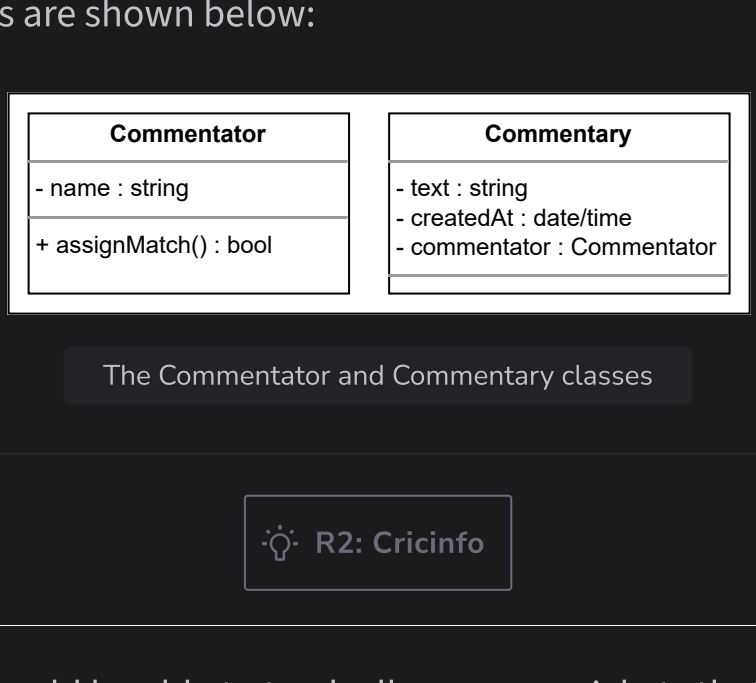
R1 and R5: Cricinfo

R1: The system should be able to track the stats of all players, teams, and matches.

R5: The system should be able to show the result of all previous televised matches.

Commentator and commentary

The `Commentator` class records the information about the commentator. The `Commentary` class contains information about the commentary for every ball of an over. The two classes are shown below:



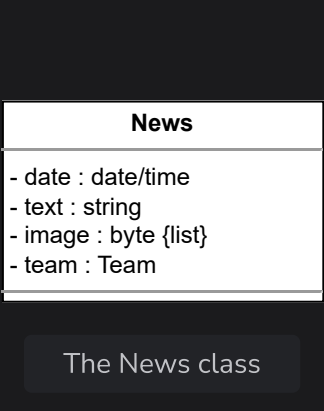
The Commentator and Commentary classes

R2: Cricinfo

R2: The system should be able to track all scores or wickets that occurred for each ball. The system should also provide a live commentary for every ball.

News

The `News` class holds the news updates of a team. The definition of this class is given below:

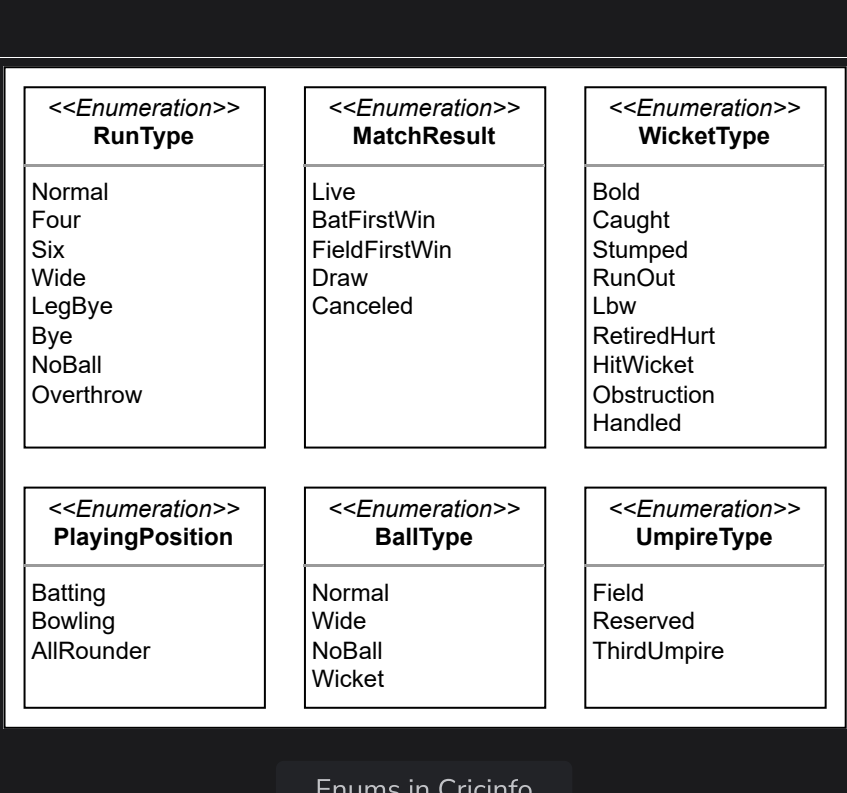


The News class

Enumerations

The enumerations required in the Cricinfo system are listed below:

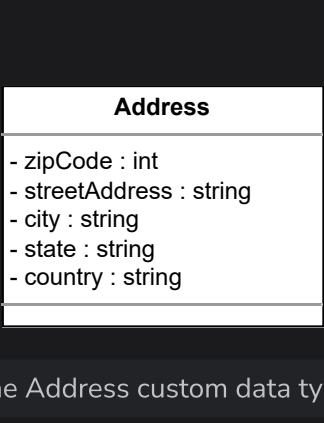
- `MatchResult`: This records the result of a match— a win, loss, canceled, or drawn.
- `UmpireType`: This records the type of umpire—field umpire, third umpire, or reserved.
- `WicketType`: This records the type of the wicket—stumped, bold, caught, etc.
- `BallType`: This records the type of ball played—a regular delivery, wide, no ball, or wicket.
- `RunType`: This records the type of run scored—a regular run, four, six, wide, etc.
- `PlayingPosition`: This records the playing position of a player—batsman, bowler, and all-rounder.



Enums in Cricinfo

Custom data type

We need to create a custom data type, `Address`, that will store the physical location of any place.



The Address custom data type

Relationship between classes

Now, we will discuss the relationships between the classes we have defined above in our Cricinfo system.

Association

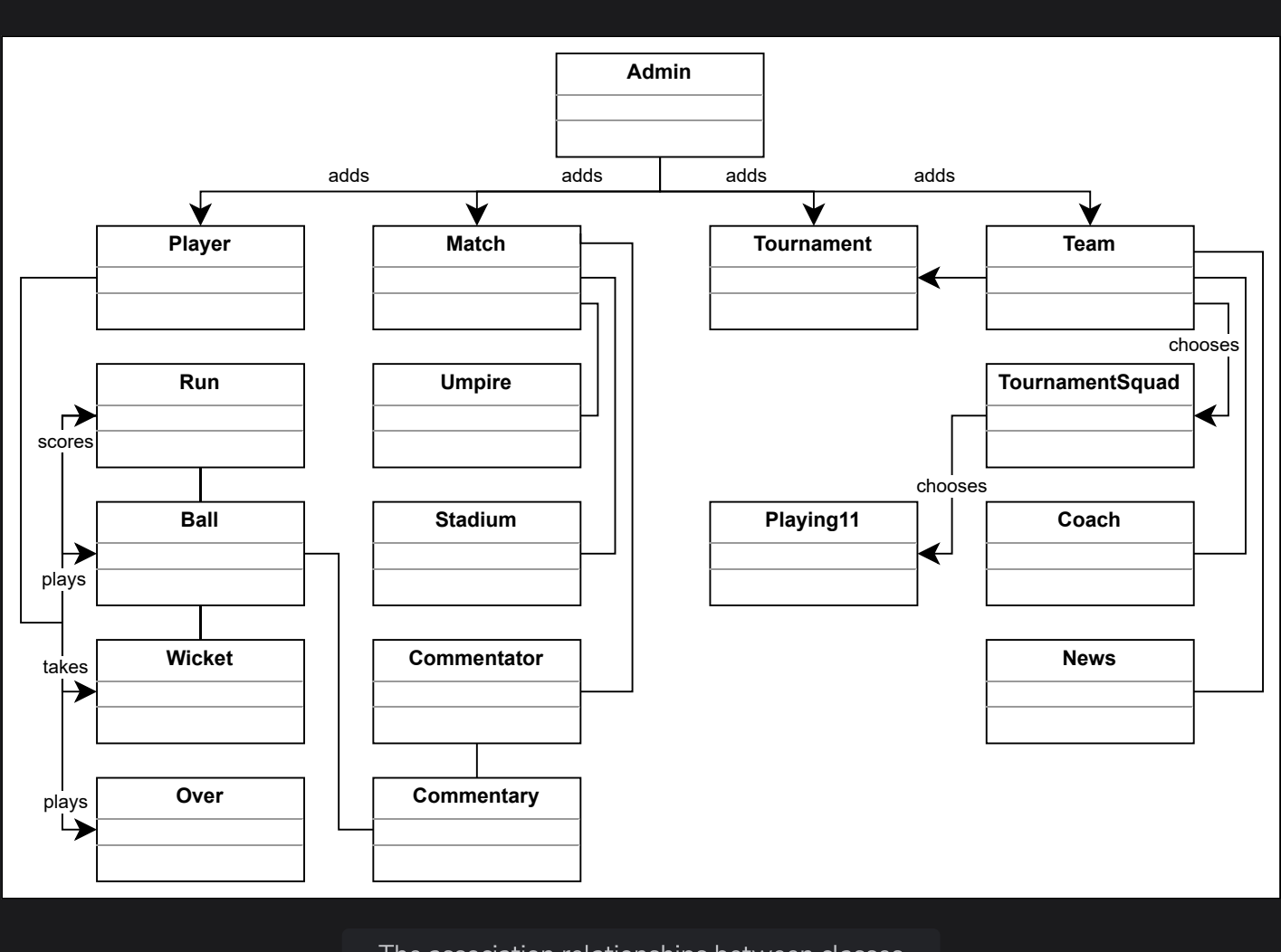
The class diagram has the following association relationships:

One-way association

- The `Admin` class has a one-way association with the `Player`, `Team`, `Match`, and `Tournament` classes.
- The `Player` class has a one-way association with the `Run`, `Ball`, `Wicket`, and `Over` classes.
- The `Team` class has a one-way association with the `TournamentSquad` and `Tournament` classes.
- The `TournamentSquad` class has a one-way association with the `Playing11` class.

Two-way association

- The `Ball` class is associated with the `Run`, `Wicket`, and `Commentary` classes.
- The `Team` class is associated with the `Coach` and `News` classes.
- The `Commentary` class is associated with the `Commentator` class.
- The `Match` class is associated with the `Umpire`, `Commentator`, and `Stadium` classes.

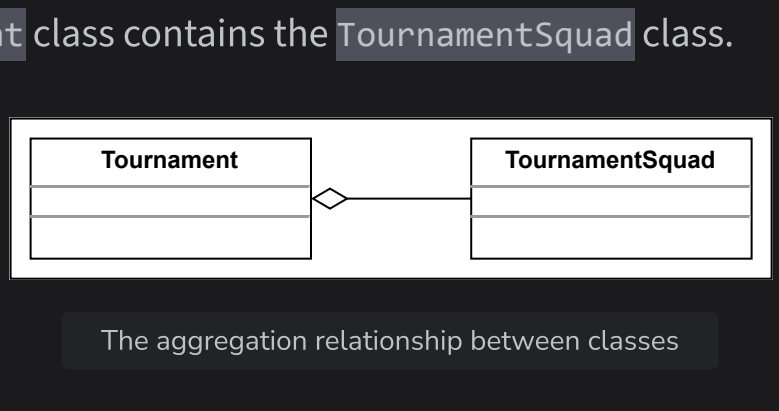


The association relationships between classes

Aggregation

The class diagram has the following aggregation relationships:

- The `Tournament` class contains the `TournamentSquad` class.

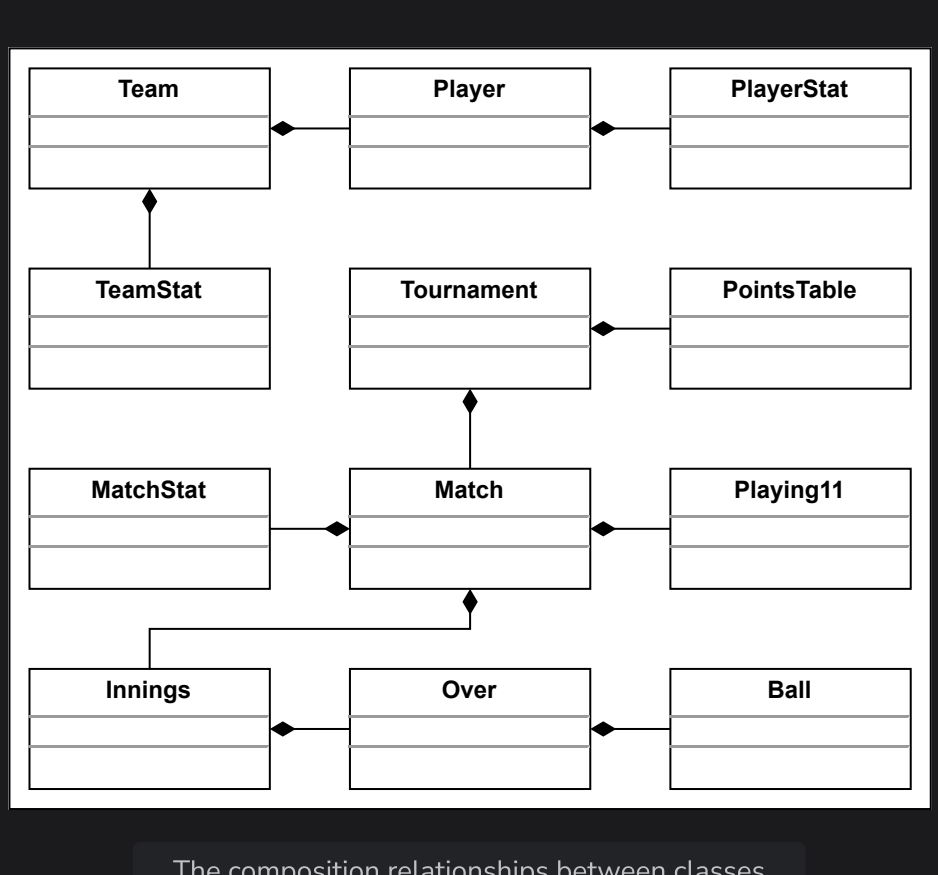


The aggregation relationship between classes

Composition

The class diagram has the following composition relationships:

- The `Player` class is composed of the `PlayerStat` class.
- The `Team` class is composed of the `Player` and `TeamStat` classes.
- The `Tournament` class is composed of the `Match` and `PointsTable` classes.
- The `Match` class is composed of the `Playing11`, `Innings`, and `MatchStat` classes.
- The `Innings` class is composed of the `Over` class.
- The `Over` class is composed of the `Ball` class.



The composition relationships between classes

Inheritance

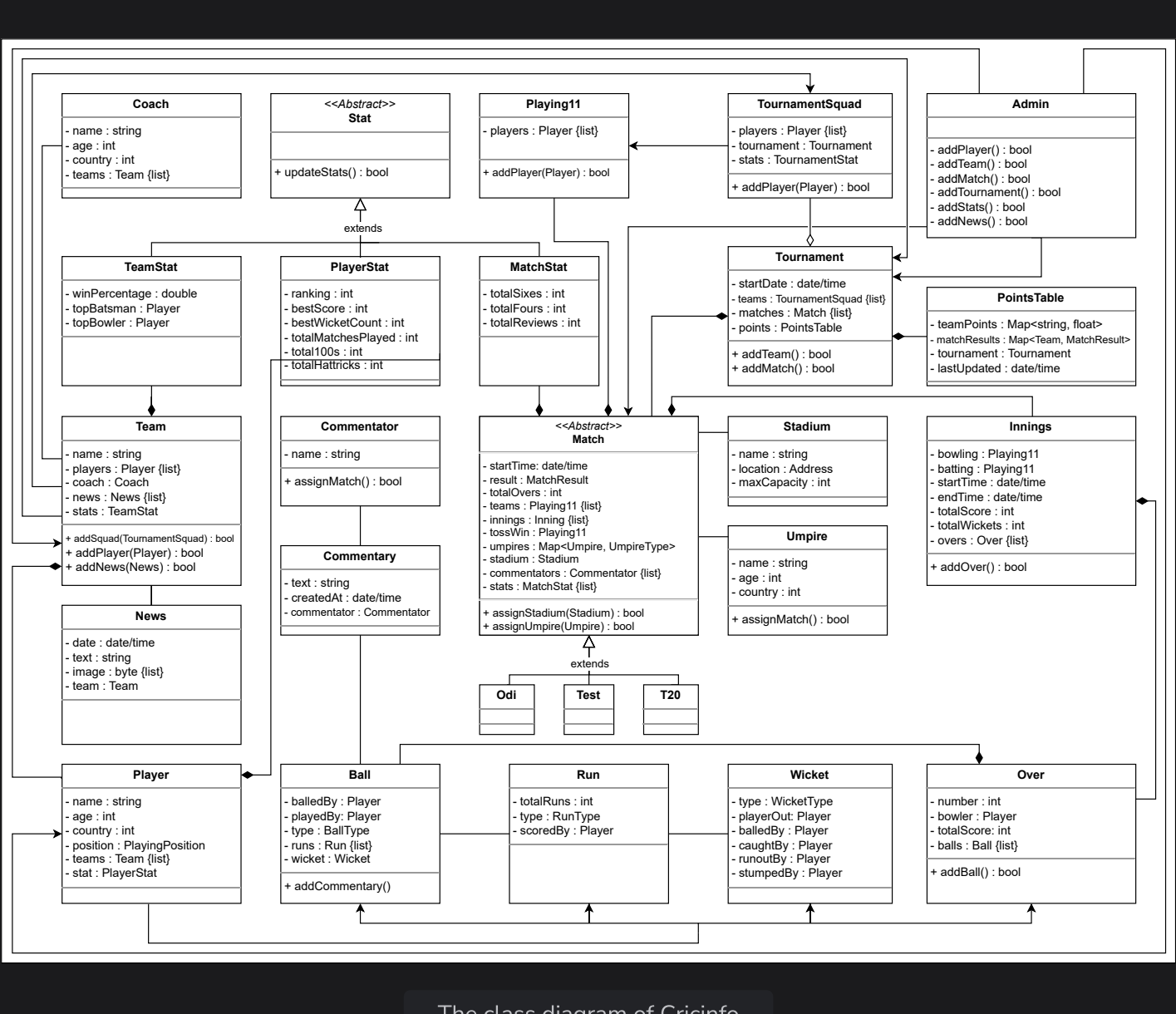
The class diagram has the following inheritance relationships:

- The `ODI`, `Test`, and `T20` classes are derived from the `Match` class.
- The `TeamStat`, `MatchStat`, and `PlayerStat` classes are derived from the `Stat` class.

> **Note:** We have already discussed the inheritance relationship between classes in the component section above one by one.

Class diagram of Cricinfo

Here's the complete class diagram for Cricinfo:



The class diagram of Cricinfo

Design pattern

In the Cricinfo system, we need to create different types of matches, tournaments, and squads at runtime. To do this, we can use the Factory design pattern. This pattern provides a way to create objects without specifying the exact class of object that will be created.

AI-powered trainer

At this stage, everything should be clear. If you encounter any confusion or ambiguity, feel free to utilize the interactive AI-enabled widget below to seek clarification. This tool is designed to assist you in strengthening your understanding of the concepts.

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Prompt AI Widget

Our tool is designed to help you to understand concepts and ask any follow up questions. Ask a question to get