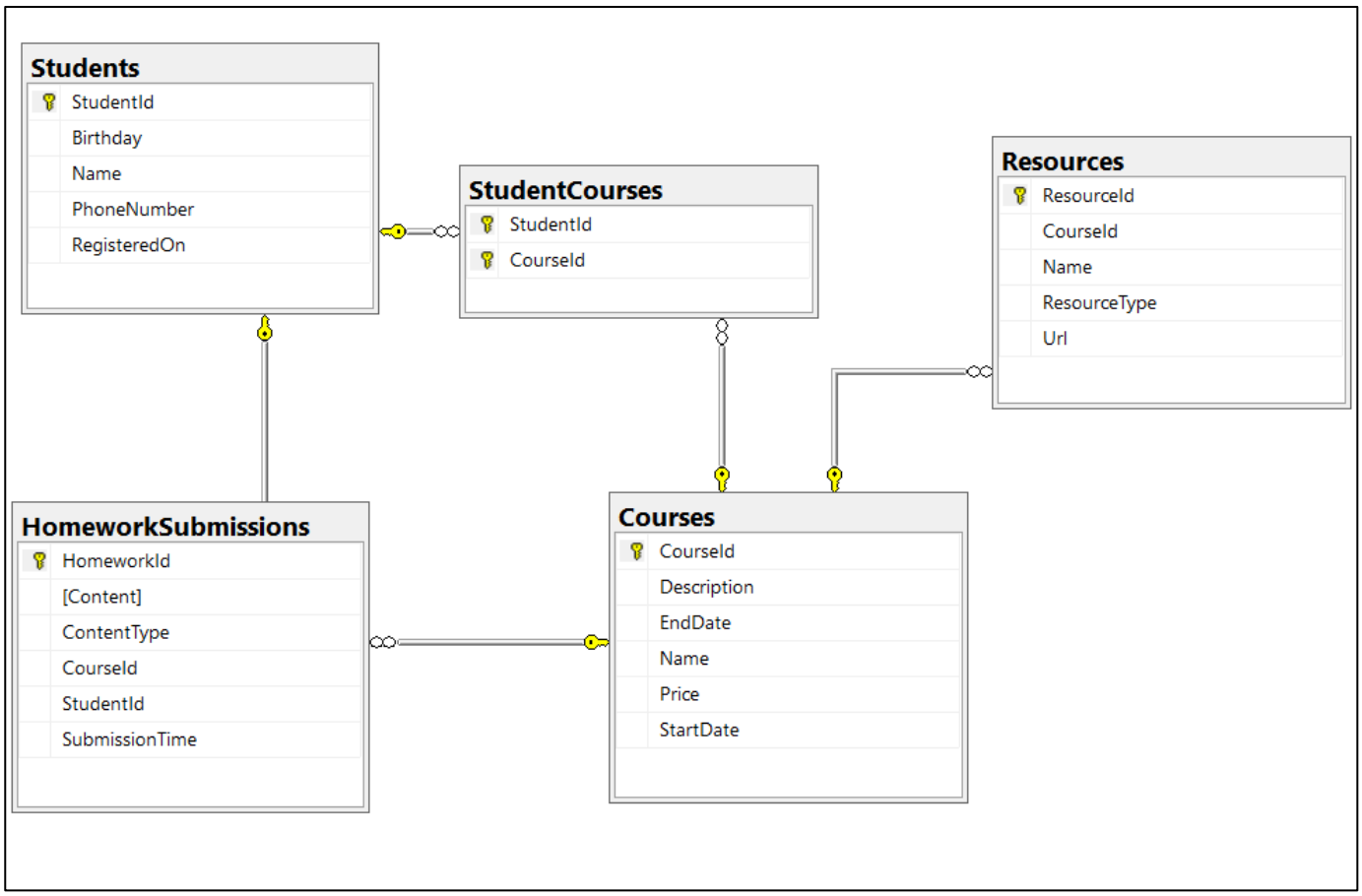
Exercises: Entity Relations

You can check your solutions here: https://judge.softuni.bg/Contests/3200/Entity-Relations.

1. Student System

Your task is to create a database for the **Student System**, using the **EF Core Code First** approach. It should look like this:



Constraints

Your **namespaces** should be:

- **`P01_StudentSystem`** – for your Startup class, if you have one
- **`P01_StudentSystem.Data`** – for your DbContext
- **`P01_StudentSystem.Data.Models`** – for your models

Your **models** should be:

- **`StudentSystemContext`** – your DbContext
- **`Student`**:
  - StudentId
  - Name (up to 100 characters, unicode)
  - PhoneNumber (exactly 10 characters, not unicode, not required)
  - RegisteredOn
  - Birthday (not required)
- **`Course`**:

    - CourseId
    - Name (up to 80 characters, unicode)
    - Description (unicode, not required)
    - StartDate
    - EndDate
    - Price
- **`Resource`**:
    - ResourceId
    - Name (up to 50 characters, unicode)
    - Url (not unicode)
    - ResourceType (enum – can be Video, Presentation, Document or Other)
    - CourseId
- **`Homework`**:
    - HomeworkId
    - Content (string, linking to a file, not unicode)
    - ContentType (enum – can be Application, Pdf or Zip)
    - SubmissionTime
    - StudentId
    - CourseId
- **`StudentCourse`** – mapping class between **Students** and **Courses**

Table relations:

- **One student** can have **many CourseEnrollments**
- **One student** can have **many HomeworkSubmissions**
- **One course** can have **many StudentsEnrolled**
- **One course** can have **many Resources**
- **One course** can have **many HomeworkSubmissions**

You will need a constructor, accepting **DbContextOptions** to test your solution in **Judge**!

```
public class StudentSystemContext : DbContext
{
    0 references
    public StudentSystemContext()
    {
    }
    0 references
    public StudentSystemContext(DbContextOptions options)
        : base(options)
    {

    }
```

Hints:

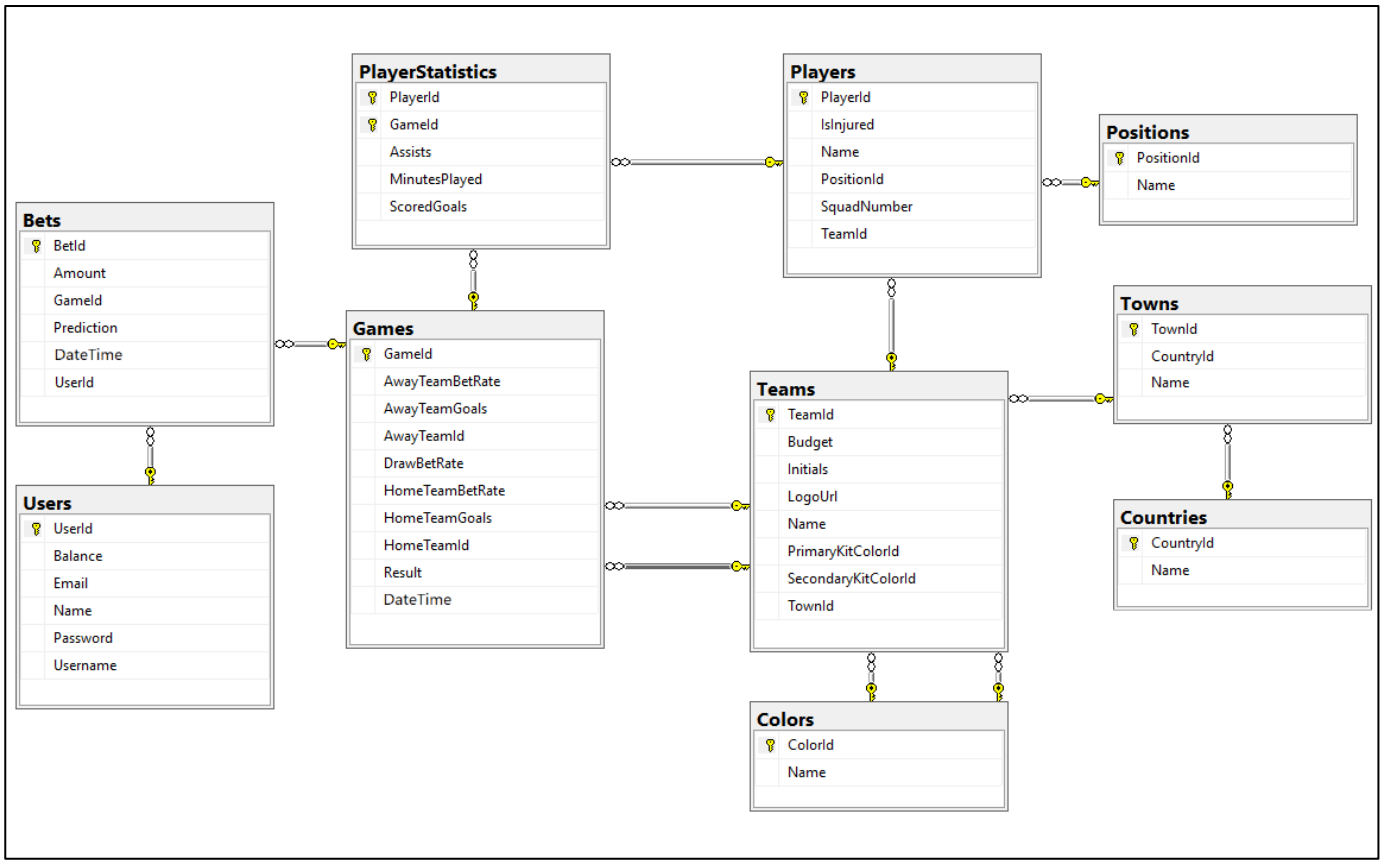
You can use HashSet in the models when initializing collections. It helps eliminates duplicate elements in an array.

```
public class Student
{
    0 references
    public Student()
    {
        this.HomeworkSubmissions = new HashSet<Homework>();
        this.CourseEnrollments = new HashSet<StudentCourse>();
    }

    1 reference
    public int StudentId { get; set; }
```

2. Football Betting

Your task is to create a database for a **Football Bookmaker System**, using the **Code First** approach. It should look like this:



Constraints

Your **namespaces** should be:

- **P03_FootballBetting** – for your Startup class, if you have one
- **P03_FootballBetting.Data** – for your DbContext
- **P03_FootballBetting.Data.Models** – for your models

Your models should be:

- **FootballBettingContext** – your DbContext
- **Team** – TeamId, Name, LogoUrl, Initials (JUV, LIV, ARS…), Budget, PrimaryKitColorId, SecondaryKitColorId, TownId

- **Color** – ColorId, Name
- **Town** – TownId, Name, CountryId
- **Country** – CountryId, Name
- **Player** – PlayerId, Name, SquadNumber, TeamId, PositionId, IsInjured
- **Position** – PositionId, Name
- **PlayerStatistic** – GameId, PlayerId, ScoredGoals, Assists, MinutesPlayed
- **Game** – GameId, HomeTeamId, AwayTeamId, HomeTeamGoals, AwayTeamGoals, DateTime, HomeTeamBetRate, AwayTeamBetRate, DrawBetRate, Result)
- **Bet** – BetId, Amount, Prediction, DateTime, UserId, GameId
- **User** – UserId, Username, Password, Email, Name, Balance

Table relationships:

- **A Team** has one **PrimaryKitColor** and one **SecondaryKitColor**
- **A Color** has **many PrimaryKitTeams** and **many SecondaryKitTeams**
- **A Team** residents in one **Town**
- **A Town** can host **several Teams**
- **A Game** has one **HomeTeam** and one **AwayTeam** and a **Team** can have **many HomeGames** and **many AwayGames**
- **A Town** can be placed in **one Country** and a **Country** can have many **Towns**
- **A Player** can play for **one Team** and **one Team** can have many **Players**
- **A Player** can play at one **Position** and one **Position** can be played by **many Players**
- **One Player** can play in **many Games** and in each **Game**, **many Players** take part (both collections must be named PlayerStatistics)
- **Many Bets** can be placed on **one Game**, but **a Bet** can be only on **one Game**
- Each bet for given game must have **Prediction** result
- **A Bet** can be placed by only **one User** and one **User** can place many **Bets**

Separate the **models**, **data** and **client** into **different layers** (projects).