

## Sport Prediction System

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# Chapter 1

## Hierarchical Index

### 1.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

CSVReader< M, P > . . . . .	5
CSVWriter< M, P > . . . . .	6
EmailService . . . . .	6
IMatchFactory< M > . . . . .	9
IMatchFactory< FootballMatch > . . . . .	9
FootballMatchFactory . . . . .	8
IMemberData< M, P > . . . . .	9
Member< M, P > . . . . .	11
Match . . . . .	10
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PredictionGame . . . . .	14
Schedule< M > . . . . .	14
Score . . . . .	15



## Chapter 2

# Class Index

### 2.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

<a href="#">CSVReader&lt; M, P &gt;</a> . . . . .	5
<a href="#">CSVWriter&lt; M, P &gt;</a> . . . . .	6
<a href="#">EmailService</a>	
Provides functionality to send emails using SMTP . . . . .	6
<a href="#">FootballMatch</a> . . . . .	7
<a href="#">FootballMatchFactory</a> . . . . .	8
<a href="#">FootballPrediction</a> . . . . .	8
<a href="#">IMatchFactory&lt; M &gt;</a> . . . . .	9
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<a href="#">Match</a>	
Abstract match class to set a frame for sport-specific kinds of matches . . . . .	10
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<a href="#">Score</a> . . . . .	15





## Chapter 3

# Class Documentation

### 3.1 CSVReader< M, P > Class Template Reference

#### Static Public Member Functions

- static void **SetMatchFactory** ([IMatchFactory](#)< M > match\_factory)
- static string[] [GetMatchDataFromCsvFile](#) (string PathToMatchDataCsvFile, int line\_number)  
*Reads the match data from a CSV file.*
- static List< M > **GetScheduleFromCsvFile** (string PathToCsvFile, SportsTypes sport\_type)
- static List< [Member](#)< M, P > > **GetMemberDataFromCsvFile** (string PathToCsvFile)
- static void **GetScoresFromCsvFile** (string PathToCsvFile, [PredictionGame](#) prediction\_game)
- static void **GetFootballPredictionsFromCsvFile** (string PathToCsvFile, [PredictionGame](#) prediction\_game, [Schedule](#)< M > schedule)

#### 3.1.1 Member Function Documentation

##### 3.1.1.1 GetMatchDataFromCsvFile()

```
static string [] CSVReader< M, P >.GetMatchDataFromCsvFile (  
    string PathToMatchDataCsvFile,  
    int line_number ) [inline], [static]
```

Reads the match data from a CSV file.

#### Parameters

<i>PathToMatchDataCsvFile</i>	The path to the CSV file containing match data.
<i>MatchID</i>	The unique identifier of the match.

#### Returns

An array of strings containing the match data.

The documentation for this class was generated from the following file:

- src/ClassLib/CSVReader.cs

## 3.2 CSVWriter< M, P > Class Template Reference

### Static Public Member Functions

- static void **UpdateSchedule** (string PathToCsvFile, List< M > schedule)
- static void **DeleteFile** (string PathToCsvFile)
- static void **WriteMemberData** (string PathToCsvFile, [PredictionGame](#) prediction\_game)
- static void **TrackScoreData** (string PathToCsvFile, [PredictionGame](#) prediction\_game)
- static void **TrackFootballPredictionData** (string PathToCsvFile, [PredictionGame](#) prediction\_game)

The documentation for this class was generated from the following file:

- src/ClassLib/CSVWriter.cs

## 3.3 EmailService Class Reference

Provides functionality to send emails using SMTP.

### Public Member Functions

- [EmailService](#) ()  
*Initializes a new instance of the [EmailService](#) class.*
- void [SendEmail](#) (string Recipient, string Sender, string Subject, string Template, Dictionary< string, string > placeholders)  
*Sends an email.*

### 3.3.1 Detailed Description

Provides functionality to send emails using SMTP.

### 3.3.2 Constructor & Destructor Documentation

#### 3.3.2.1 EmailService()

```
EmailService.EmailService ( ) [inline]
```

Initializes a new instance of the [EmailService](#) class.

## Parameters

<i>smtpServer</i>	The SMTP server address.
<i>smtpPort</i>	The SMTP server port.
<i>username</i>	The username for SMTP authentication.
<i>password</i>	The password for SMTP authentication.

### 3.3.3 Member Function Documentation

#### 3.3.3.1 SendEmail()

```
void EmailService.SendEmail (
    string Recipient,
    string Sender,
    string Subject,
    string Template,
    Dictionary< string, string > placeholders ) [inline]
```

Sends an email.

## Parameters

<i>recipient</i>	The recipient's email address.
<i>subject</i>	The subject of the email.
<i>content</i>	The content of the email.

The documentation for this class was generated from the following file:

- src/ClassLib/EmailService.cs

## 3.4 FootballMatch Class Reference

Inheritance diagram for FootballMatch:



### Public Member Functions

- [FootballMatch \(\)](#)  
Parameter free constructor to use generic type *M* in [CSVReader](#)
- **FootballMatch** (string PathToMatchDataCsvFile, int line\_number, SportsTypes sport\_type)
- override string **ToString** ()

## Properties

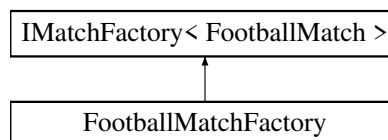
- string? **HomeTeam** [get]
- string? **AwayTeam** [get]
- byte? **ResultHomeTeamPenalties** [get]
- byte? **ResultAwayTeamPenalties** [get]

The documentation for this class was generated from the following file:

- src/ClassLib/FootballMatch.cs

## 3.5 FootballMatchFactory Class Reference

Inheritance diagram for FootballMatchFactory:



### Public Member Functions

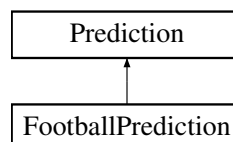
- [FootballMatch](#) **CreateMatch** (string PathToMatchDataCsvFile, int line\_number, SportsTypes sport\_type)

The documentation for this class was generated from the following file:

- src/ClassLib/MatchFactory.cs

## 3.6 FootballPrediction Class Reference

Inheritance diagram for FootballPrediction:



### Public Member Functions

- **FootballPrediction** (uint member\_id, [FootballMatch](#) football\_match, DateTime predictionDate, byte prediction\_home, byte prediction\_away)
- **FootballPrediction** (uint prediction\_id, uint member\_id, [FootballMatch](#) football\_match, DateTime predictionDate, byte prediction\_home, byte prediction\_away)
- void **ChangePrediction** (byte? NewPredictionHome, byte? NewPredictionAway)
- override string **ToString** ()

## Properties

- string? **HomeTeam** [get]
- string? **AwayTeam** [get]
- byte **PredictionHome** [get, protected set]
- byte **PredictionAway** [get, protected set]

The documentation for this class was generated from the following file:

- src/ClassLib/FootballPrediction.cs

## 3.7 IMatchFactory< M > Interface Template Reference

### Public Member Functions

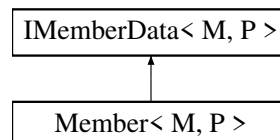
- M **CreateMatch** (string PathToMatchDataCsvFile, int line\_number, SportsTypes sport\_type)

The documentation for this interface was generated from the following file:

- src/ClassLib/MatchFactory.cs

## 3.8 IMemberData< M, P > Interface Template Reference

Inheritance diagram for IMemberData< M, P >:



### Public Member Functions

- string? **GetForename** ()
- string? **GetSurname** ()
- string **GetEmailAddress** ()
- string **GetPassword** ()
- List< M > **GetPredictionsToDo** ()
- List< P > **GetPredictionsDone** ()
- void **SetPredictionsDone** (List< P > done\_predictions)
- List< P > **GetArchivedPredictions** ()
- void **SetArchivedPredictions** (List< P > archived\_predictions)
- List< **Score** > **GetScores** ()
- void **SetScores** (List< **Score** > scores)

The documentation for this interface was generated from the following file:

- src/ClassLib/Member.cs

## 3.9 Match Class Reference

Abstract match class to set a frame for sport-specific kinds of matches.

Inheritance diagram for Match:



### Public Member Functions

- override int **GetHashCode** ()
- bool **Team1Won** ()
- bool **Team2Won** ()
- bool **Tie** ()

### Properties

- uint **MatchID** [get, protected set]  
*Unique identifier for the match.*
- DateTime **MatchDate** [get, protected set]  
*Date and time when the match takes place.*
- byte? **ResultTeam1** [get, protected set]  
*Result of team 1 in the match.*
- byte? **ResultTeam2** [get, protected set]  
*Result of team 2 in the match.*
- SportsTypes **SportsType** [get, protected set]
- string[] **MatchArray** [get, protected set]

### 3.9.1 Detailed Description

Abstract match class to set a frame for sport-specific kinds of matches.

This class provides the basic structure for any kind of sports match, including common properties like `MatchID`, `MatchDate`, and `Results`.

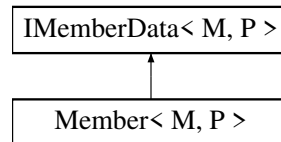
The documentation for this class was generated from the following file:

- `src/ClassLib/Match.cs`

## 3.10 Member< M, P > Class Template Reference

Represents a member participating in the Sport [Prediction](#) System (SPS).

Inheritance diagram for Member< M, P >:



### Public Member Functions

- string? [GetForename](#) ()  
*Retrieves the forename of the member.*
- string? **GetSurname** ()
- string [GetEmailAddress](#) ()  
*Retrieves the email address of the member.*
- string **GetPassword** ()
- List< M > [GetPredictionsToDo](#) ()  
*Retrieves a copy of the list of matches that need to be predicted.*
- List< P > [GetPredictionsDone](#) ()  
*Retrieves a copy of the list of the predictions already done, but not yet archived.*
- void **SetPredictionsDone** (List< P > done\_predictions)
- List< P > [GetArchivedPredictions](#) ()  
*Retrieves a copy of the list of archived predictions.*
- void **SetArchivedPredictions** (List< P > archived\_predictions)
- List< [Score](#) > [GetScores](#) ()  
*Retrieves a copy of the scores list.*
- void **SetScores** (List< [Score](#) > scores)
- [Member](#) (string forename, string surname, string emailaddress, string password)  
*Initializes a new instance of the [Member](#) class.*
- **Member** (uint member\_id, string forename, string surname, string emailaddress, string password)
- override int **GetHashCode** ()
- void [AddParticipatingSchedule](#) ([Schedule](#)< M > schedule, ScheduleTypes schedule\_type)  
*Adds a schedule to the member's list of participating schedules.*
- void [RemoveParticipatingSchedule](#) (ScheduleTypes schedule\_type)  
*Removes a schedule from the member's list of participating schedules.*
- void [AddPredictionToDo](#) ()  
*Adds a prediction to the member's list of predictions to do.*
- void [RemovePredictionToDo](#) (uint MatchID)  
*Removes a match from the member's list of PredictionsToDo.*
- void [ConvertPredictionsDone](#) (uint MatchID, byte prediction\_home, byte prediction\_away)  
*If user has predicted a certain match (specified by MatchID), a new prediction will be created ([Prediction](#) ctor call) and will be added to the PredictionsDone-list.*
- [Prediction](#) [SearchPredictionDone](#) (uint PredictionID)  
*Searches for a specific prediction in the member's list.*
- void [RemovePredictionsDone](#) (uint PredictionID)  
*Removes a prediction from the member's list of PredictionsDone.*
- void **CalculateScores** ()
- override string **ToString** ()
- [Score](#) [SearchScore](#) (ScheduleTypes schedule\_type)

## Protected Attributes

- List< M > [PredictionsToDo](#)  
*List of Matches, which need to be predicted on the specific day.*
- List< P > [PredictionsDone](#)  
*List, which contains all Predictions where the match is already predicted, but a score was not calculated yet.*
- List< P > [ArchivedPredictions](#)  
*List, which contains all Predictions where no score must be calculated anymore.*
- List< [Score](#) > [Scores](#)  
*List of Scores.*

## Properties

- uint [MemberID](#) [get]  
*Gets the unique ID of the member.*
- string? **Forename** [get, set]
- string? **Surname** [get, set]
- string **EmailAddress** [get]
- string **Password** [get]
- List< [Schedule](#)< M > > [ParticipatingSchedules](#) [get]  
*List of Schedules the member chose to participate predicting.*

### 3.10.1 Detailed Description

Represents a member participating in the Sport [Prediction](#) System (SPS).

#### Type Constraints

**P** : [Prediction](#)

**M** : [Match](#)

### 3.10.2 Member Function Documentation

#### 3.10.2.1 SearchPredictionDone()

```
Prediction Member< M, P >.SearchPredictionDone (
    uint PredictionID ) [inline]
```

Searches for a specific prediction in the member's list.

#### Returns

The prediction if found, otherwise null.



### 3.10.3 Member Data Documentation

#### 3.10.3.1 Scores

```
List<Score> Member< M, P >.Scores [protected]
```

List of Scores.

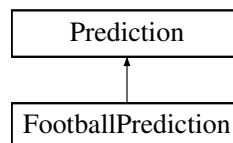
There is exactly one score for every schedule the member predicts.

The documentation for this class was generated from the following file:

- src/ClassLib/Member.cs

## 3.11 Prediction Class Reference

Inheritance diagram for Prediction:



### Public Member Functions

- **Prediction** (uint member\_id, Match predicted\_match, DateTime predictionDate)
- **Prediction** (uint prediction\_id, uint member\_id, Match predicted\_match, DateTime predictionDate)
- DateTime **GetPredictionDate** ()
- bool **ValidatePrediction** ()
- override int **GetHashCode** ()
- override string **ToString** ()

### Properties

- uint **PredictionID** [get]
- uint **MemberID** [get]
- Match **PredictedMatch** [get]
- DateTime **PredictionDate** [get, protected set]

The documentation for this class was generated from the following file:

- src/ClassLib/Prediction.cs

## 3.12 PredictionGame Class Reference

Represents a prediction game in the Sport [Prediction](#) System (SPS).

### Public Member Functions

- [PredictionGame](#) ([EmailService](#) emailService)  
*Initializes a new instance of the [PredictionGame](#) class.*
- override int [GetHashCode](#) ()  
*Get a unique Hashcode -> PredictionGameIDCounter necessary for generation.*
- void [Register](#) ([Member](#)< [Match](#), [Prediction](#) > member)  
*Registers a new member to the prediction game.*
- void [Unsubscribe](#) (int MemberID)  
*Unsubscribes a member from the prediction game.*
- void [SendDailyEmail](#) ()  
*Sends a daily email to all members with the matches that need to be predicted.*

### Properties

- uint [PredictionGameID](#) [get]  
*Gets the unique ID of the prediction game.*
- List< [Member](#)< [Match](#), [Prediction](#) > > **Members** [get, set]
- List< ScheduleTypes > **ScheduleTypesList** [get]

#### 3.12.1 Detailed Description

Represents a prediction game in the Sport [Prediction](#) System (SPS).

The documentation for this class was generated from the following file:

- src/ClassLib/PredictionGame.cs

## 3.13 Schedule< M > Class Template Reference

Generic class [Schedule](#) which represents a tournament.

### Public Member Functions

- **Schedule** (string PathToCsvFile, SportsTypes sport\_type, ScheduleTypes schedule\_type)
- List< [FootballMatch](#) > **GetFootballScheduleFromCsvFile** (string PathToCsvFile, SportsTypes sport\_type)
- List< M > **GetMatchesOnDay** ()

### Properties

- ScheduleTypes **ScheduleID** [get]
- List< M >? **Matches** [get]

### 3.13.1 Detailed Description

Generic class [Schedule](#) which represents a tournament.

It contains a list of all the matches which take place during the tournament.

Added to that it also contains a list of all the matches on the specific day of the tournament.

#### Type Constraints

**M** : [Match](#)

The documentation for this class was generated from the following file:

- `src/ClassLib/Schedule.cs`

## 3.14 Score Class Reference

### Public Member Functions

- **Score** (ScheduleTypes predicted\_schedule)
- **Score** (ScheduleTypes predicted\_schedule, uint amount\_of\_points)
- void **IncrementAmountOfPoints** (uint points)
- uint **CalculateFootballScore** ([FootballPrediction](#) prediction)
- override string **ToString** ()

### Properties

- ScheduleTypes **ScoreID** [get]
- uint **AmountOfPoints** [get, protected set]

The documentation for this class was generated from the following file:

- `src/ClassLib/Score.cs`

