**Name & Surname: Wiktor Oczkoś**

**Index: 176209**

**Project’s subject:**Football Bookmaker Database (Bukmacher Piłkarski)

**Description:**

Ever since the creation of competitive sport events, people were interested in betting on the winner of the competition. Gambling is very dangerous, addictive but also very profitable (usually for bookmakers only). In this project I have created a database for my customer which is brand new bookmaker company called EasyBet. They needed a database to organize data in a manner which allows them to query data, sort data, and manipulate data in various ways to easily operate in betting system. Users of this database are cashiers in Bookmaker’s stores that verifies bets; IT department that creates website for bookmaking; people that are betting – so they can check results and be up-to-date with football matches.

The main purpose and main goal of the database is to improve bookmaking system (which can be very complicated), to easily operate with data of company’s users and of course to quickly sort and manipulate tons of data which are hidden in football. For new company it is very important to have everything sorted and manage big amount of data.

Database is an easy way of managing the data, but also it can be even more useful. It can be used as statistical table for football experts or fans. With this database we can check players which play for our favorite team or when and where the football match is being played!

We assume that each user is over age of 18 (legal purposes). We skip random events like bad weather which results cancelling football match. We also assume that there will not be any kind of war which would result in stoppage of playing football.

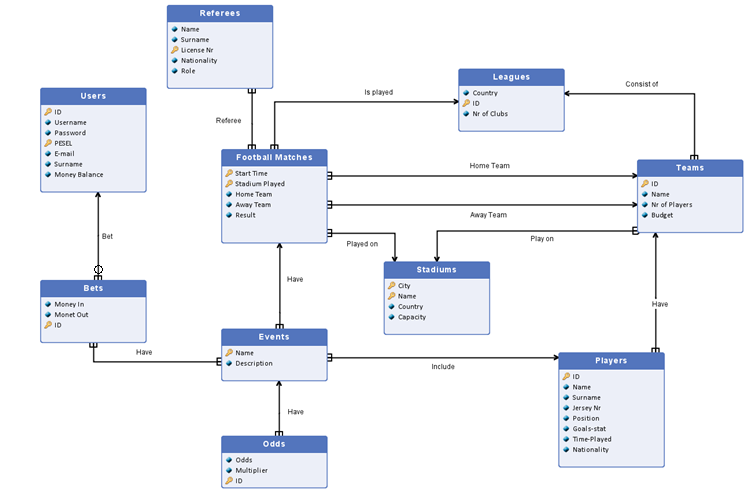
Sample inquiries:

What are the possible events for ID football match?

What league is played at ID football match?

What is the stadium where ID team play?

**ERD Diagram:**



**Description of ERD diagram:**

**Entity set: Referees**Description: set of active referees; entry added when new referee is announced, entry deleted if referee retired; ~400 entries.

Column Name: NamePrimary key: NOColumn Type: textDescription: Referee’s first name; domain is every capital and small character (even special letters from different languages), digits and special characters (!@#$%^&\*()) are excluded.

Column Name: SurnamePrimary key: NOColumn Type: textDescription: Referee’s surname; Domain: every capital and small character (even special letters from different languages), digits and special characters (!@#$%^&\*()) are excluded.

Column Name: License NrPrimary key: YESColumn Type: intDescription: Every referee has its own license and license number. Consists of 7 letters (capital letters) and 6 digits (e.g. XX-00-0000-XXXXX). Domain: digits and capital letters from A to Z (English alphabet).

Column Name: NationalityPrimary key: NOColumn Type: charDescription: Referee’s nationality. It must be real country/nationality. If referee has two or more we write dominant nationality. Domain: Characters A-Z (Name of country is written as it is in English language).

Column Name: RolePrimary key: NOColumn Type: textDescription: Each referee has its own role in football match. Domain: there are 5 possible roles: main referee, 1st linesman, 2nd linesman, technical referee, VAR referee. Only text a-z.

**Entity set: Football Match**Description: set of all current, past and future football matches; entry added when football match is announced, entry deleted after 2 years starting from Start Time attribute; ~100000 entries .

Column Name: Start TimePrimary key: YESColumn Type: datetimeDescription: Exact time and date of a football match. Format: YYYY-MM-DD hh:mm:ss. Domain is 14 digits in format written previously. ‘DD’ can’t be higher than 31, ‘MM’ can’t be higher than 12 and ‘YYYY’ must be in interval <1800;2200> , ‘hh’ can’t be higher than 23, ‘mm’ and ‘ss’ can’t be higher than 59. Everything must be positive.

Column Name: Stadium PlayedPrimary key: YESColumn Type: charDescription: Name of the stadium that football match is being played on. Domain: contains every letter (even special letters from different languages), digits and special characters (!@#$%^&\*()) are excluded.

Column Name: Home TeamPrimary key: NOColumn Type: charDescription: Name of the team that is playing on their own stadium. Domain: contains every letter (even special letters from different languages), digits and special characters (!@#$%^&\*()) are excluded.

Column Name: Away TeamPrimary key: NOColumn Type: charDescription: Name of the team that is playing away match (not theirs stadium) . Domain: contains every letter (even special letters from different languages), digits and special characters (!@#$%^&\*()) are excluded.

Column Name: ResultPrimary key: NOColumn Type: intDescription: Final result of football match. Format: 00:00. Domain: 4 digits and special character which is colon. Left side of colon is the Home Team, right side is the Away Team.

**Entity set: Users**Description: set of active and past users(clients) of EasyBet company, entry added when user register, entry deleted if the person decide to delete his account; ~10000 entries.

Column Name: IDPrimary key: YESColumn Type: intDescription: We use ID to distinguish users in easy way. ID consists of 9 digits in format 000-000000. Each digit is randomly selected. Domain: digits only.

Column Name: UsernamePrimary key: NOColumn Type: textDescription: Each user chooses their own username. Maximum 16 characters and minimum 4 characters including letters and digits. Special signs forbidden.

Column Name: PasswordPrimary key: NOColumn Type: textDescription: User’s password to verify their account. Max. 12/Min. 8 characters including letters and digits. Special signs forbidden.

Column Name: PESELPrimary key: YESColumn Type: intDescription: Polish identity number, consists of 11 digits, which include birth date in its first 6 digits; we can confirm users age (gambling = +18). Only digits.

Column Name: E-mailPrimary key: NOColumn Type: textDescription: User’s e-mail address for sending him messages and advertisements. Domain: uppercase and lowercase a-z and A-Z, digits, special characters, dot provided that it is not the first or last character and provided also that it does not appear consecutively. Example of Format: [easyWin@winner.com](mailto:easyWin@winner.com).

Column Name: SurnamePrimary key: NOColumn Type: charDescription: User’s surname; Domain: every capital and small character (even special letters from different languages), digits and special characters (!@#$%^&\*()) are excluded.

Column Name: Money BalancePrimary key: NOColumn Type: floatDescription: Exact amount of money on user’s account. Currency is PLN. Domain: only digits and one dot e.g. 12.96 PLN. There can be max 2 digits after the dot.

**Entity set: Bets**Description: set of current and past bets; entry added when user makes a bet; entries are deleted if user deletes his account; ~40000 entries.

Column Name: Money InPrimary key: NOColumn Type: floatDescription: Exact amount of money that user bet. Currency is PLN. Domain: only digits and one dot e.g. 12.96 PLN. There can be max 2 digits after the dot. Amount must be positive.

Column Name: Monet OutPrimary key: NOColumn Type: floatDescription: Exact amount of money that user won. Currency is PLN. Domain: only digits and one dot e.g. 12.96 PLN. There can be max 2 digits after the dot. Amount must be positive or equal zero.

Column Name: IDPrimary key: YESColumn Type: intDescription: Each bet must have ID to identify which user betted and to distinguish more than one bet from same user. Domain: 16 digits in format 1122334455667788, only digits.

**Entity set: Leagues**Description: set of football leagues from all around the world. Entry added when new league is formed(very rarely), entry deleted if league is being cancelled(very rarely); ~200 entries.

Column Name: CountryPrimary key: NOColumn Type: charDescription: Name of country that specific league is played in. One country may have only one league. Domain: uppercase and lowercase letters and digits only, no special characters.

Column Name: IDPrimary key: YESColumn Type: intDescription: We use ID to identify the specific league. Domain: 3 digits, format 000, only digits, everything else excluded.

Column Name: Nr of ClubsPrimary key: NOColumn Type: intDescription: Simply number of clubs that play in specific league. Domain: 2 digits, only digits, everything else excluded.

**Entity set: Teams**Description: set of teams that play in league; entry added when team is promoted to league, entry deleted if team is relegated from league; ~ 6000 entries.

Column Name: IDPrimary key: YESColumn Type: intDescription: We distinguish teams by ID because it is usually the case that there are some club name’s that are identical in different leagues. Domain: 5 digits, format 00000, only digits.

Column Name: NamePrimary key: NOColumn Type: charDescription: Each team has its own club name. Domain: uppercase and lowercase letters (even special letters from different languages), no digits and special characters.

Column Name: Nr of PlayersPrimary key: NOColumn Type: intDescription: Simply number of clubs that play in specific team. Domain: 2 digits, only digits, everything else excluded. Minimum 18 players.

Column Name: BudgetPrimary key: NOColumn Type: intDescription: Amount of money that club owns. Stated in Euro [€]. Domain: only digits, positive number.

**Entity set: Stadiums**Description: set of stadiums, place where football match happens; entry added when team has built new stadium; entry deleted if team changed stadium for a new one; ~4000 entries

Column Name: CityPrimary key: YESColumn Type: textDescription: Name of city that in which stadium is located. Domain: uppercase and lowercase letters and digits only, no special characters.

Column Name: NamePrimary key: YESColumn Type: textDescription: Each stadium has its own name. Domain: uppercase and lowercase letters (even special letters from different languages), no digits and special characters.

Column Name: CountryPrimary key: NOColumn Type: textDescription: Name of country that in which stadium is located. Domain: uppercase and lowercase letters and digits only, no special characters, real countries.

Column Name: CapacityPrimary key: NOColumn Type: intDescription: Amount of seats for people and also amount of tickets for each game. Domain: 6 digits, only digits.

**Entity set: Odds**Description: set of odds for each event; entry added when new event new event is added, entry deleted if event is deleted; ~100000 entries

Column Name: OddsPrimary key: NOColumn Type: floatDescription: Number that represent odds for each event. For example odds can be 1.53 if team A win, 3.23 if B team win and 3,20 if they draw. Domain: only digits, positive number, 2 digit max. after dot.

Column Name: MultiplierPrimary key: NOColumn Type: floatDescription: It’s a number that we can multiply or odds if we meet requirements for example if we bet at least 5 event we get 1,2 multiplier for our odds (it is kind of bonus for users). Domain: only digits, 2 digits max. after coma.

Column Name: IDPrimary key: YESColumn Type: intDescription: ID is needed to separate different odds for different events (because odds can be same for some events). Domain: 6 digits in format 000-000, only digits.

**Entity set: Players**Description: set of active players that play in teams; entry added when player is bought by club or promoted to team from youth academy, entry deleted if player retired; ~200000 entries

Column Name: IDPrimary key: YESColumn Type: intDescription: We distinguish players by ID because it is usually the case that there are some players names and surnames that are identical in same/different leagues or teams. Domain: 7 digits, format 0000000, only digits.

Column Name: NamePrimary key: NOColumn Type: textDescription: Player’s first name; domain is every capital and small character (even special letters from different languages), digits and special characters (!@#$%^&\*()) are excluded.

Column Name: SurnamePrimary key: NOColumn Type: textDescription: Player’s surname; domain is every capital and small character (even special letters from different languages), digits and special characters (!@#$%^&\*()) are excluded.

Column Name: Jersey NrPrimary key: NOColumn Type: intDescription: Number on player’s T-shirt. Domain: max. 2 digits and only digits.

Column Name: PositionPrimary key: NOColumn Type: textDescription: Position that player plays in football match. Domain: only letters (English alphabet).

Column Name: Goals-statPrimary key: NOColumn Type: intDescription: Number of goals scored by player for this club in his career. Domain: 4 digits, only digits.

Column Name: Time-PlayedPrimary key: NOColumn Type: timeDescription: Time that player spent on playfield in season. Domain: 6 digits: hh:mm:ss, ‘hh’ can’t be higher than 99, ‘mm’ and ‘ss’ can’t be higher than 59. Everything must be positive.

Column Name: NationalityPrimary key: NOColumn Type: charDescription: Player’s nationality. It must be real country/nationality. If player has two or more we write dominant nationality. Domain: Characters A-Z (Name of country is written as it is in English language).

**Entity set: Events**Description: set of events that are betted in football match; entry added when new match is added, entry deleted when football match is deleted; ~3000000 entries

Column Name: NamePrimary key: YESColumn Type: textDescription: Contains the name of event. Domain: letters and digits, no special characters.

Column Name: DescriptionPrimary key: NOColumn Type: textDescription: This text describes each event that is available. It shows us what type of event is that event. Domain: uppercase and lowercase letters, digits, special signs. Max. 256 characters.

**Relationship Description:**

Relation name: Bet Entity 1: UsersEntity 2: BetsCardinality: 1 : 0..nDescription: Each user can have multiple bets, but each bet is owned/betted by one user. User can either bet or don’t bet.

Relation name: HaveEntity 1: BetsEntity 2: EventsCardinality: 1..n : 1..nDescription: Each bet can have one or more events and different events can be composed into one or more bets.

Relation name: HaveEntity 1: EventsEntity 2: Football MatchesCardinality: 1..n : 1Description: Each football match may have many events, but each event is connected to only one football match.

Relation name: Include Entity 1: EventsEntity 2: PlayersCardinality: 1..n : 1Description: Players can be assigned to many events, but each event is assigned to one player.

Relation name: HaveEntity 1: EventsEntity 2: OddsCardinality: 1 : 1..nDescription: One odd is assigned to specific event and events can have multiple odds.

Relation name: Played onEntity 1: Football MatchesEntity 2: StadiumsCardinality: 1 : 1..nDescription: Specific football match is played on one stadium, but stadiums can host multiple football matches.

Relation name: Is playedEntity 1: Football MatchesEntity 2: LeaguesCardinality: 1..n : 1Description: Leagues have many football matches throughout the season and each football match is played in only one league.

Relation name: Consist ofEntity 1: LeaguesEntity 2: TeamsCardinality: 1 : 1..nDescription: Each team is assigned to one league and leagues consist of teams.

Relation name: Play on Entity 1: TeamsEntity 2: StadiumsCardinality: 1..n : 1Description: Stadiums might be owned/used by many clubs, but each club play on one stadium.

Relation name: RefereeEntity 1: Football MatchesEntity 2: RefereesCardinality: 1..n : 1..nDescription: Football match may have one or many referees and referees can be assigned to different football matches.

Relation name: HaveEntity 1: PlayersEntity 2: TeamsCardinality: 1..n : 1Description: Players play for only one club at the time and teams consist of many players.

Relation name: Home Team Entity 1: TeamsEntity 2: Football MatchesCardinality: 1 : 1..nDescription: Each football match is hosted by one team and team may be home team many times.

Relation name: Away Team Entity 1: TeamsEntity 2: Football MatchesCardinality: 1 : 1..nDescription: Each football match has one club playing not on their own stadium and away team may play like this many times.

**Relational database schema:**

USERS (ID, USERNAME, PASSWORD, PESEL, E-MAIL, SURNAME, MONEY BALANCE)

BETS (MONEY IN, MONEY OUT, ID, (ID, PESEL) REF USERS)

EVENTS (NAME, DESCRIPTION, (START TIME,STADIUM PLAYED) REF FOOTBALL MATCHES, ID REF PLAYERS)

HAVE (ID REF BETS, NAME REF EVENTS)

ODDS (ODDS, MULTIPLIER, ID, NAME REF EVENTS)

FOOTBALL MATCHES (START TIME, STADIUM PLAYED, HOME TEAM, AWAY TEAM, RESULT, ID REF LEAGUE, ID REF TEAMS, (CITY, NAME) REF STADIUMS)

REFEREE (LICENSE NR REF REFEREES, (START TIME, STADIUM PLAYED) REF FOOTBALL MATCH)

REFEREES (NAME, SURNAME, LICENSE NR, NATIONALITY, ROLE)

LEAGUES (COUNTRY, ID, NR OF CLUBS)

TEAMS ID, NAME, NR OF PLAYERS, BUDGET, (CITY, NAME) REF STADIUMS, ID REF LEAGUES)

STADIUMS (CITY, NAME, COUNTRY, CAPACITY)

PLAYERS (ID, NAME, SURNAME, JERSEY NR, POSITION, GOAL-STAT, TIME-PLAYED, NATIONALITY, ID REF TEAMS)