Task 1

Sport chosen: Golf

1. **The Basis of Golf**
    a. **Ball**
    b. **Clubs**
2. **Types of Golf**
3. **Stroke Play**
    a. **Hole**
    b. **Scorecard**
4. **Location**
    a. **Golf Course**
5. **Actions**
    a. **Swing**
    b. **Foul**
6. **People Involved**
7. **Player Qualification and Disqualification**
8. **Conclusion**

Each member was given a topic to research. The rough research is included in the Research pdf which has been structured and summarized to answer task 1 down below.

The basis of golf

It is a ball-and-club sport. A player chooses a club from a variety and uses it to hit a small ball with the objective to sink the ball into a hole using a minimal amount of hits, known as strokes, as possible. The club chosen depends on how far the player desires the ball to travel through the course.

Ball

The ball has a 42.7 diameter and weighs 45.9g. It is mostly made of plastic and rubber, top with a tough skin.

Clubs

A player is only allowed 14 clubs in their club bag at a time out of a variety. The main clubs are:

- Drivers with an 11.5-degree loft, an average hit distance of 230 to 260 yards, a head weight of 200 grams, and a 44 inch shaft.
- Irons are categorised by numbers 1 to 10. The lofts range from 16 to 43 degrees, average hit distances ranging from 95 to 225 yards, head weights ranging from 230 grams to 286 grams, and shafts ranging from 35.5 to 39.5 inches
- Pitching wedge with a 47-degree loft, an average hit distance of 80 to 120 yards, a head weight of 293 grams, and a 35.5 inch shaft.

- Putter. A club only used on the green. Club available with a heel, centered and hosel offset.

More varieties of clubs are available for the players to use.

Types of golf

There are a multitude of ways in which golf can be played. It can be played in teams or by individual players. The number of holes played is not fixed but depends on the type of golf played. These different types also influence how an individual or team's score is determined. In match play, for example, each hole is played in isolation with there being a winner or a tie. The player/team to have won the most holes will have won the game. While in stroke play, the holes are not played in isolation and the total score determines the winner. There is scramble, with a team playing with multiple balls and relying on the best shot, and alternate shot, where a team take turns to hit a single ball. There is gross play, where a player's score is not adjusted, and handicap play, where a player's score is adjusted according to the player's handicap—the player's abilities – for a fairer game.
Team import javax.teamMadness has limited the chosen sport to a single-player stroke play that does NOT consider handicap.

Update! Chosen sport: Golf Single-player Stroke play (gross)

Stroke play (medal play)

Stroke play is a popular and professional form of golf. It is played in championships such as the PGA, the U. S Open, the British Open, the Masters Tournament, and more.
In stroke play, a player's score is equal to the total strokes on all holes. Every stroke counts until the ball is sunk. This includes unsuccessful strokes such as air-balls – when a player swings but misses the ball—or hazard balls. Each hole's total is written on a player's scorecard.
Stroke play is limited to 18 holes in a game. There are, however, reasons for holes not being played such as weather, player illness, and match ending before the last holes are reached. For scores to be acceptable in these cases a minimum of 14 holes needs to have been played.
The number of players in a single match is not fixed, however, is kept small for golf stroke play is a long game. A single match can be split into multiple as players need not play the same match to compete.

Team import javax.teamMadness has limited the number of players participating in a single event to 5. It will not be a tournament but an event with a winner determined at the end of the game. As

stroke play is the chosen golf type, the player with the lowest stroke total is considered is the winner.

Hole

A golf hole has a regulated diameter of 108 mm and a depth of 101.6-152.4 mm. Each hole has a par, which is a predetermined number of strokes a first-class golf player should aim not to exceed when playing the hole. The par is determined by the difficulty of the hole and the distance the hole is from the tee (starting position), known as the effective playing length.

Par	Men	Women
3	0-250 yards	0-210 yards
4	251-470 yards	211-400 yards
5	471-690 yards	401-575 yards
6	+691 yards	+576 yards

Scorecard

The scorecard is a record each player has per event. It is updated after each hole is played. The scorecard records the hole and the number of strokes the player took to sink the ball into the hole. If handicaps are considered, the scorecard would include this information.

Scoring Term per hole	Explanation
Birdie	One stroke under par on an individual hole
Eagle	Two strokes under par on an individual hole
Albatross/ Double eagle	Three strokes under par on an individual hole
Condor	Four strokes under par on an individual hole
Ace/Hole-in-one	Getting the ball in the hole in only one stroke
Bogey	One stroke over par on an individual hole
Double Bogey	Two strokes over par on an individual hole
Triple Bogey	Three strokes over par on an individual hole
Quadruple Bogey	Four strokes over par on an individual hole

Location, Date and Time

Golf is a physical sport played on a golf course. A single event is played in a single day with no fixed time limit. Although night golf is plausible and is played on floodlit courses, it is rare and so all events will be limited to the daytime.

Golf Course

There are a variety of golf courses. Team import javax.teamMadness has chosen 18 hole stroke play and so the golf course the events will take place on are 18 hole golf courses. Golf courses vary in difficulty(slope rating).

The main types of golf courses are:

- ‘Link’ golf courses are very natural with little to no trees and found near coastal areas

- ‘Park land’ golf courses are found in land with lots of trees and manicured, lush, constructed grass
- ‘Desert’ golf courses are found in areas with arid climates
- ‘Heathland’ golf courses are found inland with a few pine trees and course grass

18 hole golf courses averages at 160-190 acres. Most golf course land consists of:

- The teeing areas. Closely mowed grass area where players start for each hole. There are 4 tees for each hole with varying distances from the hole, with red being the closest to the hole and black (blue-furthest) being the furthest from the hole which will be the tee area the players will use in the events. Players use a tee, which is a small pick-like stand the player uses to elevate the ball.
- The fairway. The mown stretch of land between the tee and the hole. The grass on the fairway is constantly maintained and is cut extremely short to allow for easier hitting
- The rough which is an area of tall and unmaintained grass which serves the purpose of punishing a player for lack of accuracy hence making it more difficult to hit.
- The hazards which are in and around the fairway. These consist of sand bunkers, ponds, and bushes. A ball landing in a hazard does not result in penalty but makes it hard for a player to hit the ball leading to a penalty stroke for out of bounds areas such as water hazards. Penalty strokes are when a player will need to drop their ball next to the hazard and continue playing. This counts as an extra stroke for hitting their ball out of bounds.
- The putting green. The trimmed grass area where the hole is located and is indicated with a flag.

Actions

Swing

An event of golf consists mostly of swings to hit a ball. A player’s swing influenced by a multitude of factors such as the distance and trajectory the player wishes to send the ball, the environmental conditions such as wind and land(rough, fairway, hazards), the club used to take the hit and minute details known by first class players such as angle of attack, etc.

Fouls

The first and most common penalty involves the hazards on the course If a player’s ball lands in a hazard they are required to take a ‘drop’. A ‘drop’ is when a player drops a new ball on the nearest playable location near the involved hazard. This action will result in a penalty stroke.

The second penalty is not an action but the player violating equipment regulation(clubs and balls are not within the required dimensions and weights). A 2 stroke penalty will be enforced for each hole the player has played up until the discovery of the violation.

People involved

Referee/ Rule official

The referee enforces the rules throughout the game. They regulate the scorecards and update the scoreboard accordingly. The referee writes a report of the match (scores, disqualification) and submits it to the event managers.

Commentators

They observe and commentate on the match. They inform the audience about the course statistics, and player statistics for a more immersive viewing.

Golf Coaches

They are golf specialists who train the golfers. They ensure a golfer is ready for the match. Coaches create game plans and strategies for golfers.

Course Manager

Manages the golf course as well as the staff and makes sure everyone on the course is satisfied and happy with the services offered on the course.

Caddie

A caddie is a person who carries the golfers' clubs. The carry also gives the player course statistics such as slope rating, course obstacles. The caddie usually walks ahead to locate the golfer's next hole and helps in locating a ball after a swing. A golf cart is often driven by the caddie to quicken the travel across the course.

Player/ Golfer

A golfer is a person who plays golf. To be considered as a pro golfer one must be licenced under the PGA (Professional Golf Association). The player's level is measured by handicaps, which is calculated by examining previous matches. The lower the handicap the better the golfer. Professional golfers with a handicap of 0 are known as scratch golfers.

Player Qualification and Disqualification

An example of player **qualifications** for PGA:

- Participants must be at least 18 years of age.
- Participants must have matriculated with suitable qualifications, especially in literacy sciences and math.
- Have at least a 5 handicap for men and an 8 handicap for women or lower.
- Participants must be employed by a full PGA member in a green grass environment (golf club or driving range).

SportsML does not focus on any specific event/tournament regarding a sport. It can represent local events and championships and so player qualifications should not be fixed. Team import javax.teamMadness has decided to not consider a player's qualification when added to an event.

Disqualifications

A player can be disqualified for one of the following reasons:

- Turning in an incorrect or unsigned scorecard.
    - The score is lower than the strokes taken on a hole.
    - The player has not signed scorecard.
      (If a player's score is higher than the stroke count the player will not be disqualified, but will take the higher score.)
    - Misrepresentation of handicaps.
    - Missing starting time.

      (If a player arrives within 5 minutes a 2 stroke penalty will be enforced rather than disqualification)

In conclusion, a single event will consist of five players. Tee times will be used when players start playing at different times rather then using a shotgun approach where players play simultaneously but at different holes throughout the course. The players then attempt to sink the ball into the hole with the lowest number of strokes. The total strokes will be determined at the end of the game and the player with the lowest stroke total wins.

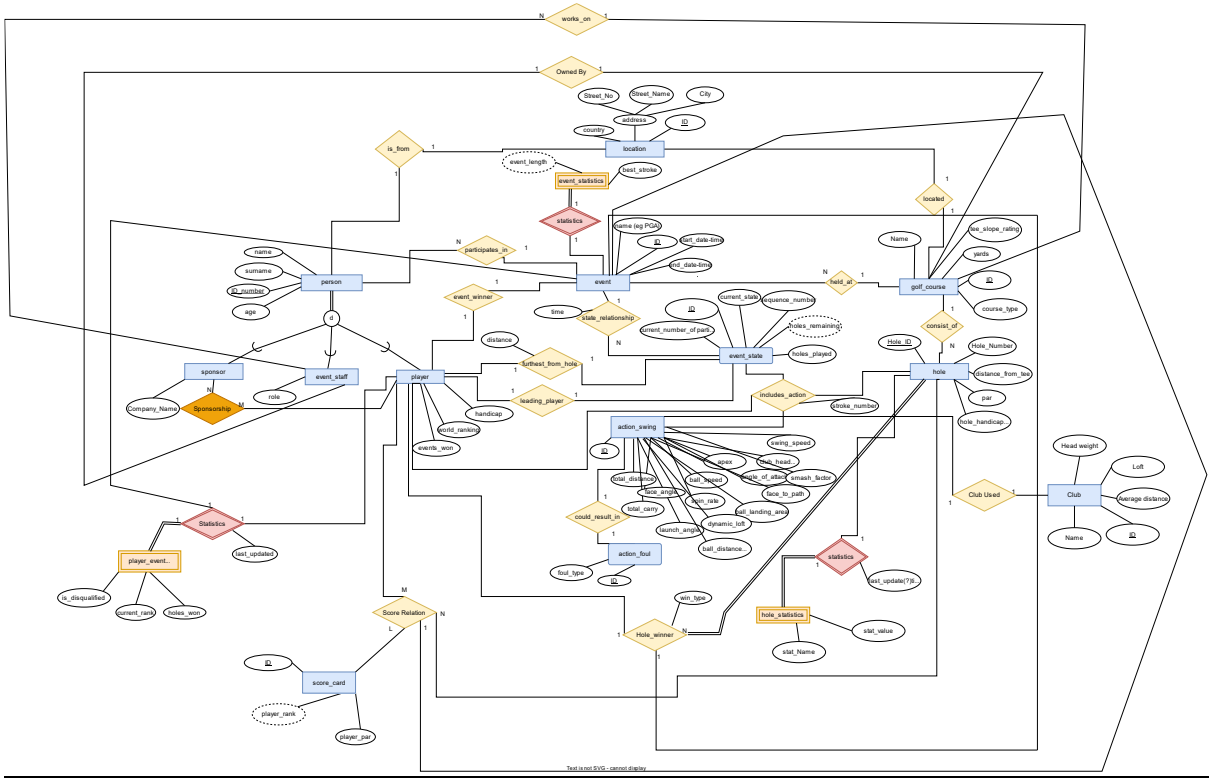
There is no tournament structure but a ranking structure. Each players individual scores will be tallied and used to determine the player rankings at the end of each event.

Task 2

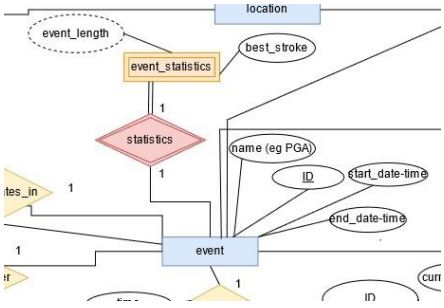
The link below contains all iterations made in designing the EER diagram

https://app.diagrams.net/#Himport-javax-teamMadness%2FCOS221PA5%2Fmain%2FE(E)R%20Diagrams%2FCOS%20221%20-%20PA5%20(E)ER%20Diagram%20v1.drawio.html

Final EER Diagram:

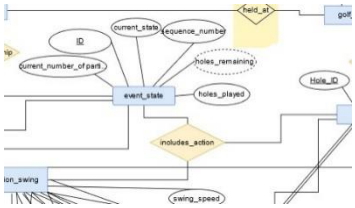


The sport structure does not include a tournament but isolated events with the players' end scores tallied to form a ranking system. Because of this the team has excluded the tournament entity from the EER diagram and focused on event.

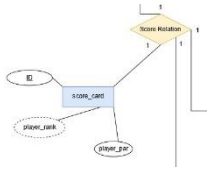


The event entity includes attributes such as name, date-time, and ID to enable identification. It has a relationship with weak entity type, event_statistics and player_event_statistics. As the structure is limited to stroke play, we have excluded statistics relating to other forms of golf. Other statistics relating to event can be derived from its relationships such as hole_winner (to player), held_at(golf_course), participants(to person), and the relationship to event_state.

Although the person structure is already included in the sportsML we have included and altered it to fit our model.



Event_state, a generic structure in the sportsML, altered to fit our chosen sport. It is linked to a single action which is swing. Each event_state is linked to the hole(period, round) the action is taking place in and the player involved. Event_state allows for in-game statistics to be captured such as player furthest from the hole, leading player and holes played.



The scorecard entity will represent the player's score on each hole. Instead of having an entity with 18 more attributes to hold the player's score on each of the 18 holes or having a 1:1:N(player: scorecard: hole) cardinality, we have chosen a 1:1:1 for a straightforward and simple relationship.

The media entity was not included in the EER diagram as it is already provided in the sportsML model. It will be able to store media associated with events, players, and golf courses.

Task 3

The complete relational mapping is in the file Relational Mapping.pdf

Step 1: Mapping of Strong Entity Types

Person:

ID_Number	Name	Surname

The simplified version of the sportsDB persons table. (will use the sportsDB in database)

Location:

Location_ID	Street_No	Street_Name	City	Country

Event:

ID	Name	Start_DTime	End_DTime

Event_State:

Event_State_ID	Time	Current_no_participants	Current_State	Sequence_Number	Holes_Played

Action_Swing:

Swing_ID	Total-carry	Face_angle	Launch_angle	Distance-from_hole	Dynamic_Loft	Spin_rate	Ball_Speed	Apex	Ball_Landing_Area	Face_to_path	Angle_of-attack	Smash_factor	Club_head_Speed	Swing_speed	Total_Distance

Hole:

Hole_ID	Hole_Number	Distance_from_tee	Par

Score Card:

Score_Card_ID	Player_par

Club:

Club_ID	Club_Name	Average_Distance	Loft	Head_weight

Action_Foul:

Action_Foul_ID	Foul_Type

Step 8: Mapping Generalisation and Specialisation

First approach:

Sponsor:

Sponsor_ID(fk)	Company_name

Person superclass

Staff:

ID_Number(fk)	role

Person superclass

Player:

ID_Number (fk)	Events_won	World_ranking	Handicap

Person superclass

Step 2: Mapping of weak entity types

Hole_Statistics:

Hole_ID (fk)	Statistic_Name	Stat_value

Owned by Hole

Player_Event_Statistics:

Event_ID	Player_ID_Number	Current_status	Is_disqualified	Holes_won	Last_Updated

Owned by Player and Event

Event_Statistics:

Event_ID	Best_stroke	Money_won

Owned by Event

Step 3: Mapping binary 1:1 relations

Foreign key approach:

Person:

ID_Number	Name	Surname	Is_From(fk)

Foreign key to location

Golf_Course:

Golf_Course_ID	Name	yards	Owner-ID(fk)	Course_Type	Location_ID (fk)

Foreign key to location and person

Event_Statistics:

Event_ID	Best_stroke	Money_won

Foreign key to player

Action_Foul:

Action_Foul_ID	Foul_Type	Action_Swing_ID(fk)

Foreign key to Action_swing

Action_Swing:

Swing_ID	To tal-car ry	Fa ce_ angle	Lau nch_ an gle	Dista nce-fr om_ hole	Dyn amic_ Loft	Spi n_ rate	Bal l_ Sp eed	Ap ex	Ball_ Lan d ing_ Area	Face _to_ path	Angle _of-at tack	Sm ash_ factor	Club_ he ad_ Spe ed	Swi ng_ spe ed	To tal_ Dist ance	Club _us ed (fk)

Foreign key to club

Cross reference approach: Choice for this approach is so that the following tables can be used as lookups

Player_Furthest_From_Hole:

Event_State_ID (fk)	Player_ID(fk)	Distance

Foreign key to player and event state

Leading_Player:

EventState_ID	Player_ID

Foreign key to player and event state

Step 4: Mapping 1:N binary relations

Foreign key approach:

Event_Staff:

ID_Number(fk)	Role	WorksCourse_ID(fk)

Foreign key to golf course for works on

Hole:

Hole_ID	Hole_Number	Golf_Course_ID(fk)	Distance_from_tee	Par

Foreign key to golf course

Event_State:

Event_State_ID	Event_ID(fk)	Time	Current_no_participants	Current_State	Sequence_Number	Holes_Played

Foreign key of Event for state-relationship

Cross reference approach: Choice for this approach is so that the following can be used as lookups and to avoid redundant data

Held_At: Golf_Course_ID (fk) | Event_ID (fk)	Foreign key to golf course and event
Participates_in: Person_ID(fk) | Event_ID(fk)	Foreign key to person and event

Step 7: Mapping of N-ary relationships:

Hole_Winner: Hole_ID(fk) | Player_ID(fk) | Event_ID(fk) | Win_type	Foreign keys to hole, player, event
Score_relation: Hole_ID(fk) | Score_Card_ID(fk) | Player_ID(fk) | Event_ID(fk)	Foreign keys to hole score card player and event

Action: Event_State_ID(fk) | Player_ID(fk) | Hole_ID(fk) | Action_Swing_ID(fk) | Stroke_Number	Foreign keys to event state, player, hole, action swing

Task 4

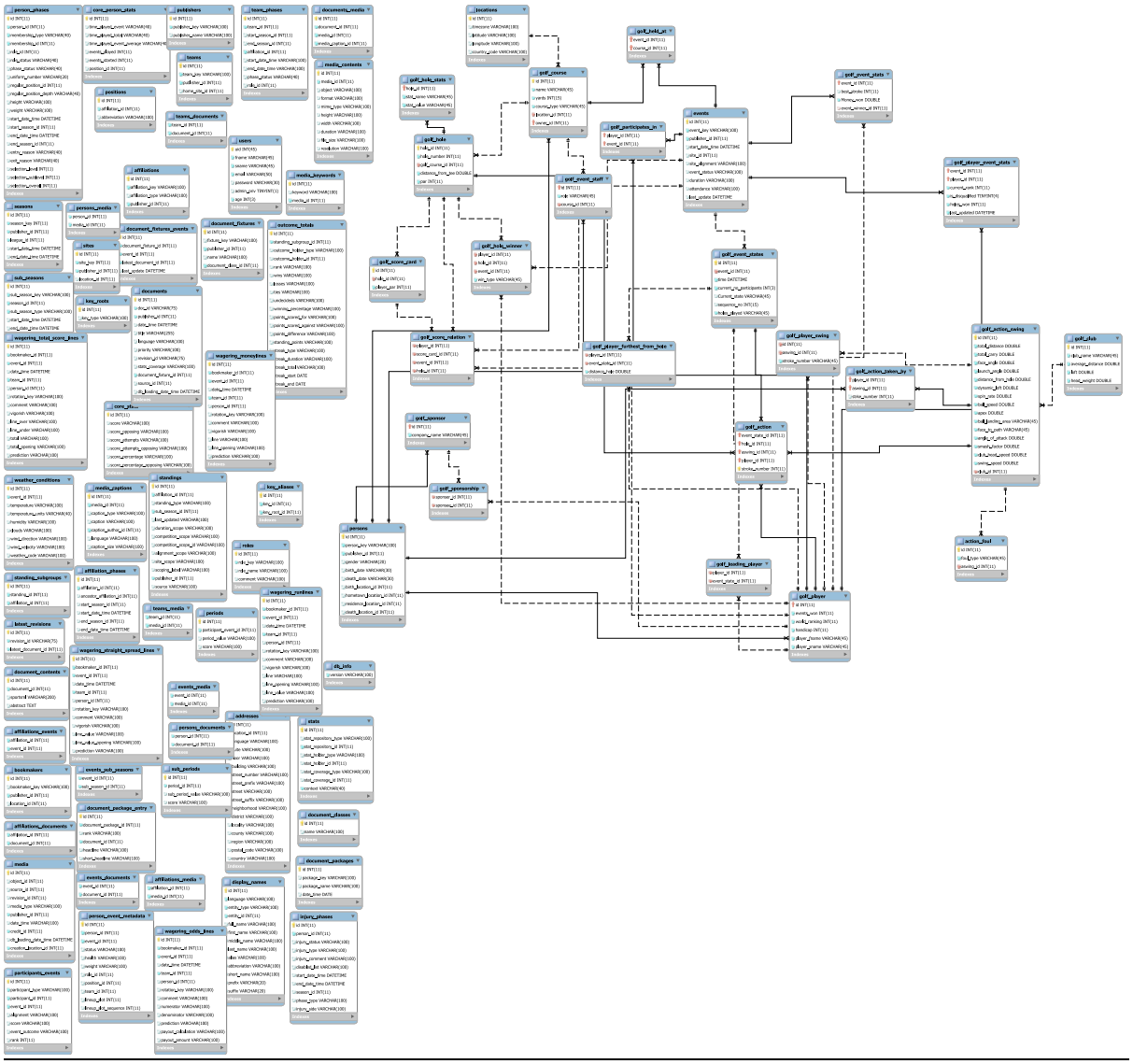
The visual diagram is included as a pdf, png, and svg in the zip file submitted for better viewing

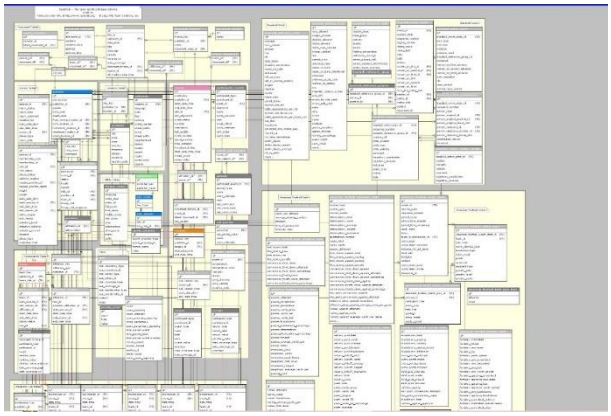
Key legend used to represent the primary key, foreign key and constraints:

Key: (Part of) Primary Key
Filled Diamond: NOT NULL
Not filled Diamond: NULL
Red coloured: (Part of) Fore
Blue lined Diamond: Simple a

Can be combined for example:

is a Red coloured Key so it's a Primary Key which is also a Foreign Key
is a Yellow (non Red) Key so it's only a Primary Key
is a blue lined filled diamond so it's a NOT NULL simple attribute
is a red coloured filled diamond so it's a NOT NULL Foreign Key
is a blue lined not filled diamond so it's a simple attribute which can be NULL
is a red coloured not filled diamond so it's a Foreign Key which can be NULL





The relational database extension was designed according to the SportsDB modal. The default sports were removed and the golf tables incorporated into the database. (most of the links(foreign key representations were not included in the visual diagram as were not needed in the UI functionality but are present in the dump file).

The dump is included in the zipped folder submitted allow with the readme.txt file

Task 5

Things to note:

1) Marker will need to change the password for their mariadb. This should be done in config.php file and in all $password variables

2) Login default user: email: root@root.root password: 1234

3) Manage User page: Administration code: 1234

Task 6

We choice to manually insert the data as no API's could be found with data that correspond to our structure.

PERSONS:

ID NUMBER	NAME	SURNAME	IS FROM
0	Billy	Horschel	1
1	Aaron	Wise	1
2	Patrick	Cantlay	1
3	Joaquin	Niemann	2
4	Max	Homa	1
5	Will	Zalatoris	1
6	Denny	McCarthy	1
7	Sahith	Theegala	1
8	Daniel	Berger	1
9	Sungjae	Im	3
10	Jon	Rahm	4
11	Corey	Conners	5
12	Mito	Pereira	2
13	Si	Woo Kim	3
14	Davis	Riley	1
15	Cameron	Smith	6
16	Xander	Schauffele	1
17	Garrick	Higgo	7
18	Keith	Mitchell	1
19	Brian	Harman	1
20	Sarah	Lynn	7
21	Veronica	Brussel	4
22	Genevive	Hambridge	2
23	Mariah	Decker	3
24	Sarah	O'Connel	1
25	Luke	Nebraska	4
26	Jason	Mamoa	7
27	Francis	Oliver	3
28	Jessica	Tin	1
29	Robert	Fyres	2
30	Michael	Cage	3
31	John	Trainer	2
32	Werner	Olivier	7
33	Fiona	Brewis	5
34	Mike	Gregory	6
35	James	Franco	6

LOCATION:

LOCATION ID	STREET NO	STREET NAME	CITY	COUNTRY
1	117	JOHN F KENNEDY	NEW YORK	USA
2	52	FRANCIS	SANTIAGO	CHILE
3	67	SHIN LI	SEOUL	KOREA
4	22	GRACIAS	BARCELONA	SPAIN
5	1	NICE	TORONTO	CANADA
6	23	CRICKY	SYDNEY	AUSTRALIA
7	56	JOHN MASELA	PRETORIA	SA

EVENT STAFF:

EVENT STAFF	ROLE	WORKCOURSE ID
20	CLEANER	0
21	MARSHALL	0
22	MARSHALL	1
23	OFFICIAL	2
24	CLEANER	1

SPONSOR:

SPONSOR ID	COMPANY NAME
25	NIKE
26	ADIDAS
27	ROLEX
28	UNDER ARMOR
29	CALLAWAY
30	TAYLOR MADE
31	CASIO
32	PING

SPONSORSHIP:

SPONSOR ID	SPONSEE ID
25	0
25	1
26	2
32	3
30	4
31	5
32	6
32	7
27	8
28	9
29	10
30	11
31	12
32	13
32	14
30	15
28	16
27	17
29	18
26	19

EVENT:

EVENT ID	NAME	START DTIME	END DTIME
0	Ryder Cup	SEP 16	SEP 19
1	Sanderson Farms Championship	OCT 14	OCT 17
2	ZOZO CHAMPIONSHIP	OCT 7	OCT 10
3	Butterfield Bermuda Championship	SEP 30	OCT 3
4	Shriners Children's Open	SEP 24	SEP 26

Club

Club_ID	Club_Name	Average_Distance(yards)	Loft(degrees)	Head_weight(grams)
1	Driver	250	11.5	200
2	Iron 1	95	16	230
3	Iron 2	100	17	244
4	Iron 3	119	19	248
5	Iron 4	126	20	253
6	Iron 5	155	21	256
7	Iron 6	168	25	259
8	Iron 7	187	29	262
9	Iron 8	210	33	271
10	Iron 9	215	38	275
11	Iron 10	225	43	283
12	Pitching wedge	118	47	286
13	Putter	20	0	170

Action swing.

Swing_ID	Club_Used_Id	Total_Carry(yards)	Face_angle	Launch_angle	Distance_from_hole(yards)	Dynamic_loft	Spin_rate	Ball_speed	Apex	Ball_Landing_Area	Face_to_path	Angle_of_attack	Smash factor	Club head speed	Swing speed	Total distance
1	2	98	16	17	80	16	20	120	133	120		**-3.0**	**-3.0**	**89**	**89**	80
2	1	245	11.5	11.5	250	11.5	15	133	120	133		-1.3	-1.3	113	113	250
3	3	110	19	16	112	19	19	144	144	144		-3.1	-3.1	98	98	112
4	6	140	26	22	162	18	22	166	155	166		-4.1	-4.1	92	92	162
5	8	190	30	24	190	21	25	154	162	154		-4.5	-4.5	94	94	190
6	7	190	24	23	180	24	23	140	128	140		-4.3	-4.3	90	90	180
7	5	158	20	39	159	26	30	147	134	147		-3.7	-3.7	94	94	159
8	4	117	16	33	124	32	28	139	157	139		-3.4	-3.4	96	96	124
9	10	205	40	25	218	22	33	169	160	169		-4.7	-4.7	85	85	218
10	11	221	45	19	224	17	42	171	162	171		-4.9	-4.9	90	90	224
11	12	95	46	47	110	47	50	155	120	155		-5.0	-5.0	83	83	110
12	13	16	0	0	18	0	0	152	121	152		-4.3	-4.3	0	0	18
13	2	138	16	16	99	42	10	131	133	131		-3.9	-3.9	88	88	99
14	4	123	17	31	122	40	39	171	165	171		-3.2	-3.2	89	89	122
15	7	148	28	40	171	39	48	170	145	170		-4.0	-4.0	92	92	171
16	6	199	23	28	166	35	25	169	139	169		-4.2	-4.2	97	97	166
17	10	217	42	20	221	30	52	158	155	158		-4.4	-4.4	89	89	221
18	9	203	35	22	214	22	30	143	169	143		-4.6	-4.6	86	86	214
20	8	189	30	26	201	17	29	149	166	149		-4.9	-4.9	94	94	201
21	3	112	15	33	118	33	31	156	158	156		-3.8	-3.8	80	80	118
22	11	99	45	43	223	37	55	169	153	169		-3.6	-3.6	90	90	223
23	5	143	20	20	136	29	21	160	139	160		-3.3	-3.3	93	93	136

Action Foul

Action foul id	Foul type	Action swing id
0	**Out of bound**	**5**
1	**Ball in water hazard**	**3**
2	**Ball moved after address**	**6**
3	**Picking up the ball**	**10**
4	**Playing out of turn**	**1**

Rest of mock data in the submitted folder

Task 7

We have analysed our SQL statements for optimisation.

1) Checked SQL statements for missing indexes.
2) Avoided using OR in the FILTER predictions
3) Avoided using JOINS
4) We did; however, use SELECT * rather than SELECT [fields]

```
265                 {
266                     $i = intval($ID);
267
268                     $selectquery2 = " SELECT *
269                     FROM golf_player
270                     WHERE id = '$i'";
271
272                     $result1 = $conn->query($selectquery2);
273                     $a = mysqli_fetch_assoc($result1);
```

(example from config.php file). Line 268

Optimisation:

SELECT id, player_fname, player_sname

This way only data that is needed and utilised is fetched. This gained performance as less storage was used.

5) We did not use TOP to sample query results
6) We cannot optimise whether our queries are executed during off-peak hours or not and so this was not considered when we analysed the queries. [peak hours, more users making queries to the database and so performance is at its lowest]
7) Creating joins with INNER JOIN instead of where

```
247
248         $selectquery = " SELECT player_id
249         FROM golf_participates_in
250         WHERE event_id = '$eventID'";
251
252         $result = $conn->query($selectquery);
253
254         if( mysqli_num_rows($result) > 0)
255         {
256             for($x=0; $x< mysqli_num_rows($result); $x++)
257             {
258                 $arr = mysqli_fetch_array($result);
259                 $array[$x]= $arr['player_id'];
260
261
262             }
263             $y=0;
264             foreach($array as $ID)
265             {
266                 $i = intval($ID);
267
268                 $selectquery2 = " SELECT *
269                 FROM golf_player
270                 WHERE id = '$i'";
```

(example from config.php file) lines 250 and 270

Optimisation:

Instead of having multiple queries using where and INNER JOIN could be used

Joining the two tables

Task 8

Group contributions:

Robert Officer -u20431122: Research for task 1 was conducted, my research was conducted on the types of clubs used in golf as well as the qualifications needed to be a professional golfer. For task 2 I contributed multiple iterations of the EER, each iteration bringing either additions or improvements including cardinalities and relationships. Task 3 I was in charge of the relational arrows on the mapping and I created the database from which the group worked off of. And lastly I developed the "Players" pages for task 5.

Vincent Mostert - u20531550:

Task 1: research

Inserting mock data into the DB into the following tables (where applicable): All tables starting with, affiliation, documents, events, persons, wagering aswell as locations, golf_event_staff, golf_sponsor and golf_sponsorship. Contributed the necessary commits to git.

Letlhogonolo Rakgantsho-21612812 . Contributions: Task 1 Research, EER Diagram (Adding weak entity types and their relationships), Relational Mapping , Collected and added Mock Data to database (Event State, Player, Hole, Score Card, Golf Course) and made necessary commits to git

Keabetswe Madumo -u20438614: pdf editor. Task 1 research on swings, ranking system, and types of golf. Task 2 EER skeleton (without weak entities, cardinalities). Task 3 Relational mapping drawing and colouring along with inserting steps taken by team into pdf. Task 4 constructed visual diagram. Task 5 made the user management(add user, view users, delete users, find user), score capturing, and media page. Task 7 used mariadb tools to check query performance, analysed and optimised some queries. Responsible for pdf and readme files

Michael Geere - u20466570 contribution: Task 1 research, Implementation of front-end web application in php(login, createUser, EventsPage, addEvent etc.), Implementation of back-end of the web application (login validation, create user validation, calling events from the db, adding events into the db, editing events within the db) as well as the necessary git contributions such as commits and project-board use

Careen Muyombo- u19069945

Contributions: Task 1 research, Relational mapping (1:1, 1:N, M:N , multivalved attributes, specialization and generalisation) and Adding mock Data to database (action_foul, action_swing, golf_club, golf_action_taken_by) and creating php header file