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Database Systems

**UNIVERSITY OF WESTMINSTER**

**INFORMATICS INSTITUTE OF TECHNOLOGY**

Module Leader: Ragu Sivaraman

Coursework: Part A + Part B

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| Name | Henda Marakkala Tharindu Dilshan Madushanka |
| UoW Number | 20522090 |
| IIT Number | 20232113 |
| Group | CS G-16 |

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# Coursework Part A: Conceptual EERD

## QUESTION 1: CRITICAL EVALUATION & REFLECTIVE COMMENTARY

## QUESTION 2: ENTITIES

|  |  |
| --- | --- |
| **Entity Name** | **Brief Explanation** |
| w2052209\_Park | This General w2052209\_Park entity describes all the parks contain in the small town called Ovestminster in UK. |
| w2052209\_Court | This General w2052209\_Court entity describe all the Courts contain in a dedicate park for racket sport. |
| w2052209\_Caretacker | This General w2052209\_Caretacker entity describes all Racketminster caretakers who are responsible for their preservation. |
| w2052209\_Equipment | This General w2052209\_Equipment entity describes all the movable or fixed equipment allocated to respective court |
| w2052209\_Maintaince\_Record | This General w2052209\_Maintaince\_Record entity describes all the maintenance records of each court and equipment |
| w2052209\_Player | This General w2052209\_Player entity represents all player who participate in racket-based sports |
| w2052209\_Session | This General w2052209\_Session entity describes all the sessions like Supervised and Unsupervised to run on specific court |
| w2052209\_Instructor | This General w2052209\_Instructor entity describes all Instructors who assign in to Supervised sessions. |
| w2052209\_Booking | This General w2052209\_Booking entity describes all the Booking sessions who book by a specific player. It can be either Block booking or Single booking |

## QUESTION 3: SPECIALISATIONS

|  |  |  |
| --- | --- | --- |
| **General Entity** | **Specialized Entity** | **Brief Explanation** |
| w2052209\_Court | w2052209\_Tennis | Courts dedicated to tennis, used exclusively for tennis matches and sessions. |
| w2052209\_Pickleballo | Courts dedicated to pickleball, used exclusively for pickleball matches and sessions. |
| w2052209\_Maintaince\_Record | w2052209\_Court\_Record | Maintenance records specifically for courts to track upkeep and ensure courts are in proper condition. |
| w2052209\_Equipment\_Record | Maintenance records specifically for equipment to ensure all items are well-maintained and functional. |
| w2052209\_Equipment | w2052209\_Fixed | Fixed equipment such as nets, which are permanently installed and allocated to specific courts. |
| w2052209\_Moveble | Movable equipment such as rackets and balls, which can be used across different courts as needed. |
| w2052209\_Booking | w2052209\_BlockBooking | Bookings that allow players to reserve multiple unsupervised sessions in advance, often with follow-up sessions. |
| w2052209\_SingleBooking | Standard bookings for individual sessions, allowing players to reserve a single session for their chosen activity. |
| w2052209\_Session | w2052209\_Supervised | Sessions supervised by qualified instructors, either for individual or group guidance. |
| w2052209\_Unsupervised | Sessions where players participate independently, without instructor oversight. |
| w2052209\_Unsupervised | w2052209\_Single | Unsupervised sessions for two players, typically organized for single player matches. |
| w2052209\_Double | Unsupervised sessions for four players, allowing for doubles matches. |
| w2052209\_Supervised | w2052209\_Personal | One-on-one supervised sessions with an instructor, allowing personalized guidance and training. |
| w2052209\_Group | Supervised group sessions where multiple players participate under the supervision of up to two instructors. |
| w2052209\_Group | w2052209\_Fitness | Group sessions focused on fitness, combining exercise and racket sports practice under instructor supervision. |
| w2052209\_GroupCoaching | Structured group coaching sessions aimed at improving skills at various levels under the guidance of an instructor. |
| w2052209\_SocialFun | Relaxed, social group sessions for players to socialize and enjoy playing sports, with an instructor providing oversight. |

## QUESTION 4: RELATIONSHIPS & MULTIPLICITIES

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Entity Name** | **Multiplicity** | **Relationship** | **Multiplicity** | **Entity Name** | **Brief justifications for the multiplicity** |
| **w2052209\_Park** |  |  |  | **w2052209\_Court** | Each park must contain at least one court for players |
|  | 1..1 | contain | 1..\* |  | A park can contain multiple courts for different racket sports |
|  |  |  |  |  | A court cannot exist without being part of a park |
|  |  |  |  |  | One specific court can be only that one park |
| **w2052209\_Court** | 1..1 | allocate | 1..\* | **w2052209\_Equipment** | Each court is allocated equipment necessary for racket sports |
|  |  |  |  |  | A court may have multiple equipment items, like nets and balls |
|  |  |  |  |  | Equipment is designated to a specific court to ensure availability and maintenance |
|  |  |  |  |  | Courts must have at least one piece of equipment allocated to them |
|  |  |  |  |  | Courts are maintained by caretakers assigned specifically to them. |
| **w2052209\_Court** | 0..1 | maintain | 1..\* | **w2052209\_Caretacker** | A court can be without a caretaker, but typically at least one caretaker is responsible for its upkeep |
|  |  |  |  |  | Multiple caretakers may be involved to handle different aspects of court maintenance |
|  |  |  |  |  | Caretakers are dedicated to ensuring courts are playable and safe |
| **w2052209\_Caretacker** | 1..\* | maintain | 0..\* | **w2052209\_Equipment** | Caretakers are responsible for maintaining all assigned equipment |
|  |  |  |  |  | Each piece of equipment may have one or more caretakers responsible for its condition |
|  |  |  |  |  | Some equipment might not need immediate maintenance, hence the 0 multiplicity |
|  |  |  |  |  | Maintenance involves regular checks, repairs, and replacement if necessary |
|  |  |  |  |  | Each maintenance record is managed by a caretaker for tracking purposes |
| **w2052209\_Caretacker** | 1..1 | manage | 0..\* | **w2052209\_Maintaince\_Record** | There can be multiple records managed by a caretaker, based on maintenance needs. |
|  |  |  |  |  | A record might not always exist if no maintenance is required at that time |
|  |  |  |  |  | Records ensure accountability and proper upkeep of equipment and courts |
|  |  |  |  |  | Each session is held on a specific court booked for that purpose |
| **w2052209\_Session** | 0..1 | book | 1..1 | **w2052209\_Court** | A court must be booked for a session to occur |
|  |  |  |  |  | Sessions may sometimes not be booked, allowing flexibility in court use |
|  |  |  |  |  | Booked courts allow players to have dedicated time for their activities |
|  |  |  |  |  | Each booking is tied to a specific session |
| **w2052209\_Booking** | 1..1 | book | 1..1 | **w2052209\_Session** | Both booking and session must exist for players to attend |
|  |  |  |  |  | Bookings ensure organization and that sessions are scheduled appropriately |
|  |  |  |  |  | Players must book to reserve their spot in a session |
|  |  |  |  |  | A player may not recommend another player |
| **w2052209\_Player** | 1..\* | recommend | 0..\* | **w2052209\_Player** | A player can recommend many players |
|  |  |  |  |  | One player is no player May not be recommended |
|  |  |  |  |  | One player can be recommended by many players |
|  |  |  |  |  | A player can be without make a booking |
| **w2052209\_Player** | 1..\* | book | 0..\* | **w2052209\_Booking** | A player can have multiple bookings based on their preferences |
|  |  |  |  |  | A booking must have at least one player |
|  |  |  |  |  | A booking can have multiple players |
|  |  |  |  |  | A Block booking must have a one Unsupervised session |
| **w2052209\_BlockBooking** | 0..1 | book | 1..1 | **w2052209\_Unsupervised** | In specific time duration a block booking has only one Unsupervised session |
|  |  |  |  |  | Unsupervised session can be without making a booking |
|  |  |  |  |  |  |
|  |  |  |  |  | Each supervised session must guide by at least one instructor |
| **w2052209\_Instructor** | 1..2 | coach | 0..\* | **w2052209\_Supervised** | Each supervised session can have maximum two instructors |
|  |  |  |  |  | Instructor can exist without any Supervised sessions |
|  |  |  |  |  | Instructor can have many Supervised sessions |

## QUESTION 5: ATTRIBUTES & PRIMARY KEYS

|  |  |  |
| --- | --- | --- |
| Entity Name | Attributes for each entity (include PK) | Brief explanation |
| **w2052209\_Park** | w2052209\_parkId {PK} | Unique identifier for each park in Ovestminster. |
| w2052209\_parkName | Name of the park (e.g., Green Park, Riverside Park). |
| w2052209\_location | Physical location of the park, including address or description. |
| w2052209\_condition | Current state or quality of the park (e.g., excellent, good, fair). |
| **w2052209\_Caretacker** | w2052209\_caretackerId {PK} | Unique identifier for each caretaker responsible for park maintenance. |
| w2052209\_caretackerName | Name of the caretaker. |
| w2052209\_trainingLevel | Level of training the caretaker has received (e.g., basic, advanced |
| **w2052209\_Maintaince\_Record** | w2052209\_maintenanceId{PK} | Unique identifier for each maintenance record associated with parks or courts. |
| w2052209\_date | Date when the maintenance was conducted |
| w2052209\_time | Time of day the maintenance took place |
| w2052209\_status | Status of the maintenance (e.g., completed, in-progress) |
| w2052209\_log | Detailed notes or log about the maintenance performed |
| w2052209\_Court\_Record | w2052209\_netCondition | Current condition of the net on the court |
| w2052209\_surfaceCondition | Description of the court’s surface condition |
| **w2052209\_Equipment\_Record** | w2052209\_equipmentType | Type of equipment associated with a court (e.g., rackets, balls) |
|  | w2052209\_repairRequired | Indicates if repair is needed for the equipment (yes/no) |
| **w2052209\_Court** | w2052209\_courtId {PK} | Unique identifier for each court |
| w2052209\_condition | Overall condition of the court (e.g., playable, under repair) |
| w2052209\_type | Specifies the type of court (e.g., tennis, pickleball, multi-purpose) |
| **w2052209\_Tennis** | w2052209\_surfaceSpeed | Speed rating of the court surface, affecting tennis play |
| **w2052209\_Pickleball** | w2052209\_paddleStorage | Availability of storage specifically for pickleball paddles |
| **w2052209\_Equipment** | w2052209\_equipmentID{PK} | Unique identifier for each piece of equipment |
| w2052209\_condition | Current condition of the equipment (e.g., good, needs repair) |
| w2052209\_name | Name or label of the equipment (e.g., tennis racket, net) |
| w2052209\_type | Specifies whether the equipment is fixed or movable |
| **w2052209\_Fixed** | w2052209\_installedDate | Date when the fixed equipment was installed |
| **w2052209\_Moveble** | w2052209\_weight | Weight of the movable equipment, important for portability |
| **w2052209\_Player** | w2052209\_playerId{PK} | Unique identifier for each player registered in the scheme |
| w2052209\_name | Name of the player |
| w2052209\_level | Player's skill level (e.g., beginner, intermediate, advanced) |
| **w2052209\_Booking** | w2052209\_bookingID{PK} | Unique identifier for each booking made for a session |
| w2052209\_date | Date of the booked session. |
| w2052209\_time | Time of the booked session |
| w2052209\_bookingType | Type of booking (e.g., single session, block booking) |
| **w2052209\_BlockBooking** | w2052209\_bookingCount | Number of sessions included in a block booking. |
| **w2052209\_SingleBooking** | w2052209\_status | Status of the single booking (e.g., confirmed, canceled) |
| **w2052209\_Instructor** | w2052209\_InstructorId{PK} | Unique identifier for each instructor |
| w2052209\_name | Name of the instructor. |
| w2052209\_contactNumber | Contact number of the instructor for communication |
| w2052209\_email | Email address of the instructor |
| w2052209\_expertiseLevel | Level of expertise or specialization of the instructor (e.g., beginner, advanced) |
| **w2052209\_Session** | w2052209\_sessionId{PK} | Unique identifier for each session offered in Racketminster. |
| w2052209\_startTime | Start time of the session |
| w2052209\_endTime | End time of the session |
| w2052209\_type | Type of session (e.g., supervised, unsupervised) |
| **w2052209\_Supervised** | w2052209\_type | Specifies supervised session category (e.g., fitness-play, group coaching) |
| w2052209\_equipmentNeeded | Equipment required for the session (e.g., rackets, balls) |
| w2052209\_level | Level requirement for participation in the supervised session |
| **w2052209\_Personal** | w2052209\_focusArea | Specific areas of focus in a personal training session |
| w2052209\_instructorNote | Notes made by the instructor for personalized training guidance |
| **w2052209\_Group** | w2052209\_sessionType | Group session category, such as social-fun or group coaching |
| w2052209\_size | Maximum number of participants in a group session |
| **w2052209\_Fitness** | w2052209\_exerciseType | Type of exercise performed during a fitness-play session |
| w2052209\_fitnessLevel | Fitness level required for participants in the fitness-play session |
| **w2052209\_GroupCoaching** | w2052209\_coachingLevel | Level of coaching provided in the group coaching session |
| **w2052209\_SocialFun** | w2052209\_activities | List of activities conducted in a social-fun session, such as games and social exercises |
| **w2052209\_Unsupervised** | w2052209\_sessionFormat | Format of the unsupervised session (e.g., singles or doubles) |
| w2052209\_sessionType | Category of the unsupervised session, such as open play |
| w2052209\_duration | Duration of the unsupervised session |
| **w2052209\_Single** |  |  |
| **w2052209\_Double** |  |  |

## QUESTION 6: CONCEPTUAL EERD QUALITY & NOTATIONS

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# Coursework Part B: Logical ERD