Project Phase 1: Requirements Document

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Introduction

Sauna Heating World Championship; the miniworld is about a competition that takes place in teams that aim to heat a sauna tent up to a specific temperature as quickly as possible. The quickest teams will compete in the finals. To take part in this competition, all one needs is cooperation skills, good team spirit, and a positive mindset.

Purpose

The purpose of this database is to make the accessing of information regarding the various components of our miniworld such as events, participants, etc., easier and user- friendly. Our purpose is to store and retrieve data more effectively for a numerous set of users mentioned in the next section of this document. We aim at managing the data by reducing the redundancy of data and by making the single update of the data across various softwares and across various data sources regarding this miniworld.

Users

1. Casual end users:
    a. General public: They are the common people who get the limited view of a selected section of the database for getting updates on the events happening and the winners in such events.
2. Naive or parametric end users:
    a. Participants and other members: The members registered to the website can check details regarding upcoming events, and their position in the past events.
3. Sophisticated end users:
    a. Information Technology Department: They'll be responsible for maintaining the database, hosting the website and other related work.
    b. Marketing Department:They can possibly monitor website analytics and help with improving the outreach of the organisation. As sophisticated users they'll have deeper access to the database.
    c. Event management team: They are the people who make sure the races run smoothly behind the scenes, they can store information regarding the events on the database, and can update any changes in case of any scheduling conflicts.

   d. Accounting Department: Newly registered membership fees and purchase information can be sent directly to Accounting, allowing for more accurate and timely billing.
4. Standalone users:
   a. Presidium and Association representatives: These are members of the management team, they'll most likely use the database to keep themselves updated on the different parts of the organisation.
   b. Database designers: They are the people who design and manage the database according to the guidelines of the organisation of miniworld.

Applications

Our database will be extensively used by the participants and the event organisers to keep track of the participants, the available events, the total scores, the winners, and all the essential aspects of the mini-world and the competition. General public benefits by looking at the championship for various countries and by keeping track of the statistics of the competition.

Database Requirements

Entities

1. Events
   a. Event ID: ***Key attribute***
   b. Event name
   c. Date of event
      i. Should be in a valid date format
   d. Time of the event
      i. Should be of hh:mm format
      ii. In GMT
   e. Country
   f. City
   g. Venue of the event
   h. Winner Male
   i. Winner Female
   j. Overall winner
   k. Contact person name
   l. Contact person email
      i. Valid email id
   m. Result link
   n. Category
      i. Single letter
   o. Additional Info
   p. Previous edition
2. Points
   a. Gender category
      i. Male or female
   b. Event ID
   e. Penalty points
   f. Bonus points
   c. Participant ID: ***Key attribute***
   d. Participant Name

g. Special points
h. Total points: derived attribute from penalty points, bonus points and special points.

3. Participants
   Contains one **subclass**: Winners

a. Participant ID : ***Key attribute***
b. Participant name
c. Gender Category
d. Country
e. Height
f. Date of birth
g. Age: derived attribute from date of birth

4. Presidium

a. Position
   i. Name of managerial position
b. Photo
c. Name: alternate key
d. Employee ID: super key
e. Email id: candidate key
f. Quote: composite attribute having sub-attributes as author name and quote content

5. Accomodation

a. Hotel/motel name: multivalued attribute
   i. This can be a list of hotels which are vacant at the time of applying.
b. Website: ***Key attribute***
c. Telephone no.: ***Key attribute***
d. Email
e. Bookings
   i. Number of bookings to this location

6. Saunas and hot tubs

a. Name: ***Key attribute***
b. Theme
c. Location: composite attribute having location name and the location coordinates as its sub-attributes
d. Picture: multivalued attribute
   i. This can be a list of photos describing the hot tub.
e. Description
   i. Describes the history of the sauna and experience the user can expect.

7. Winners

This is a **subclass** of the Participants entity type.

a. Participant ID: ***Key attribute***
b. Participant name
c. Gender Category
d. Country

Weak Entity:

8. Statistics: Participants Ranking by country
    a. Year
    b. Championship name
    c. Gender category
        i. Two categories: Male and Female
    d. Athlete name
    e. Country code : weak key
    f. Country flag
        i. Image of flag
    g. Distance run
    h. Participant ranking
9. Statistics: Country Ranking
    a. Year
    b. Championship name
    c. Country name
    d. Country code
    e. Country flag
    f. Average points

Relationships

1. Relationship 1: Event mapper
   This relationship identifies the events in which each of the participants have been enrolled in.
    a. Degree: 2
    b. The relationship is between Events and the Participants.
    c. The min, max constraint for race events entity type is (50, N) and for participants entity type is (0, N)

2. Relationship 2: Maximum Points
   This relationship maps each of the events in the event entity type with the maximum points scored by the winner in each of these respective events.
    a. Degree: 2
    b. Between Events and Points
    c. The min, max constraint for the race events is (1,1) and for the points is (0,N)
3. Relationship 3: Tub tracker
   This relationship is responsible for tracking the hot tubs available for each of the events.
    a. Degree: 2
    b. Between Events and Saunas and Hot tubs

    c. Cardinality ratio: 1:N
4. Relationship 4: accommodate
   This relationship is responsible for storing the data regarding the accommodation of each of the participants.
    a. Degree: 2
    b. Between participants and accomodation
    c. Cardinality ratio: N: 1
5. Relationship 5: team builder
   This relationship is responsible for storing the teams formed for a given event. A team consists of two participants and this relationship maps those two participants with each other.
    a. Degree: 1
    b. Between participants entity type to participants entity type
    c. Cardinality ratio: 1:1

n>3 Relationships:

6. Relationship 6: Score Calculator
   This relationship gives the information about the points scored by each participant at each hot tub for a given event.
    a. Degree: 4
    b. The entity types are Events, Participants, Saunas and hot tub and Points
    c. Cardinality ratio: 1:n:n:1

   This relationship Score Calculator can be modelled differently by making “Score Calculator” a weak entity type and by replacing the above 4 degree relationship with 4 binary relationships, say R1, R2, R3 and R4. The definition of those 4 relationships are:
    1. R1 is a binary relationship which is between the weak entity type Score Calculator and the identifying entity type Events.
    2. R2 is a binary relationship which is between the weak entity type Score Calculator and the identifying entity type Participants.
    3. R3 is a binary relationship which is between the weak entity type Score Calculator and the identifying entity type Saunas and hot tub.
    4. R4 is a binary relationship which is between the weak entity type Score Calculator and the identifying entity type Points.

Functional Requirements

Modifications

1. Insert: Adds a new tuple to a given entity type. This function is also capable of adding a new attribute with a set of attributes to a given entity type. Further overloading of these functions assigned a value for a given attribute of a given entity.
   Example: Addition of a new participant to the participant entity type

2. Delete: Removes a tuple in a given entity type. It is also capable of removing an attribute from a given entity type.
   Example: Delete the participant whose ID is 383845.
3. Update: Updates the value of a given attribute for a given entity.
   Example: Change the event ID from 273438 to 838389 in the events entity type.
4. Analysis:
    a. Inclusion of the winner in the Events entity type based on the maximum total points found in the points entity type.
    b. Addition of a new hotel in the accommodation entity type if the number of vacant rooms >= 20
    c. Deletion of the athlete from the participant's list if the penalty points >= 100, from the points entity type.
    d. Update the date of an event if the number of participants registered for a given event is less than 50 in the events entity type.
    e. Ask and update the age of the participant whenever a new entity is being added to the events.

Retrievals

1. Selection: Selects a given tuple.
   Example: select the tuple in participants entity type where participant ID is 383843
2. Projection: Projects a given attribute for a given entity type.
   Example: Project all the total scores of all the participants.
3. Aggregate: This function executes the constraints such as MIN, MAX, SUM, COUNT, RANGE and AVG.
   Example: count and display the number of participants whose total score is greater than 1000.
4. Search: This function searches for a tuple based on given conditions.
   Example: Search for the entity where the participant ID is 833474 in the participants entity type.
5. Analysis:
    a. Select 200 tuples in the events, in which the particpant's points in the points entity type is maximum.
    b. List all the participants in a given race event based on the gender category in the participants entity type.
    c. Display the names of all the participants based on their country name.
    d. Count and nominate all the participants for the next event whose height is in the range of 140 - 160 cm.
    e. Search for any Australian male participant whose height is 150 cm.