Requirements Analysis

Group 9 –

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Introduction

Our mini-world is https://www.crufts.org.uk which is the official website for a UK based company called Crufts. Crufts hold yearly dog shows and related events at multiple venues. The website has an international audience which is kept in mind while designing the database. The company is able to hold these events with the help of its sponsors whose stalls is a main attraction during the events. The judges for these events are assigned to a particular dog group such as hound group, gundog group, etc.

Purpose

The data on the website mainly consists of information about sponsors, judges, event locations and dates etc. However, during the registration process for various competitions, a lot of additional data is required to be stored. This includes the name of the participating dog, its owner, contact info etc. which has been discussed in the list of entities. This information and its relationship with other related information such as the competitions the dog will be participating in, the venues of the competitions etc. should be made available to the users in a convenient format for their reference. In addition to this the event managers should have access to details such as sponsors, judges and their respective dog group and finally the number of contests won by a dog at the end of the competition for making the certificate.

Users

Users are mainly dog show enthusiasts who'd like to participate in competitive events along with their furry friends. They'll access data relating to judges, event dates and venues. They'll interact with this data with the help of the GUI which the website provides. The search bar brings up the valid links to the required data which helps the users keep track of the contest schedule.

Applications

The database has real world applications in the field of managing large scale events through a website. All the information must be provided to the users in a fluid and easily accessible manner. The information needs to be updated yearly as the venue for the events change and hence the database is required to be able to facilitate this.

Database Requirements

Entities

Dog

1. Group name – (TEXT), cannot be NULL

Value set- { Hound group, Gundog group, Terrier group, Utility group, Working group, Pastoral group, Toy group}

2. Breed name – (TEXT), cannot be null, multivalued for cross breeds min = 1
3. Id_no. – (INTEGER, 7 digits) each dog will have an id number that will prove useful for identifying the dog when registering for a competition, integer, unique, key attribute, no 2 dogs can have the same id_no.
4. Name – the name of the dog – (TEXT), cannot be NULL
5. Height- height of dog in centimetres (INTEGER)
6. Weight- weight of the dog to place it in the appropriate categories (INTEGER)
7. Gender (M/F)

Judge

1. Name (TEXT), cannot be NULL
2. Judge id- key attribute (INTEGR, 4 digits)
3. Gender (M/F)

Venue

1. Country name (TEXT) cannot be NULL
2. Address (street_address, city, state, country) (TEXT + INTEGER, TEXT, TEXT) cannot be NULL

Country name+address Together form a key attribute

Competition

1. Name (TEXT) cannot be NULL
2. Date (multi- valued as each competition can be held on multiple dates) (dd/mm/yyyy)

Name + date Together form a key attribute

Owner

1. Name (f_name, l_name) (TEXT,TEXT)
2. Mobile_no. – partial key (INTEGER, 10 digits)
3. Email_address – must contain @
4. Gender (M/F)
5. Address (street_address,city, state, country)

Sponsor

1. Name – key attribute
2. contact_info(telephone no, email address)

Weak Entity:

Owner

1. The owner entity is a weak entity as it **only exists if it owns a dog that is participating** in the competition.
2. The identifying relationship is **Owned by** and the identifying entity is the **Dog entity** type.
3. Its partial key is **Mobile_no.** as it uniquely identifies an instance of the owner entity.

Relationships

Judged by

1. **Degree** - 4
2. **Participating entities:**
    a. Dog
    b. Judge
    c. Venue
    d. competition
3. **Cardinality constraints:**
    a. Dog:Judge:Venue:Competition = (d,j,v,1) – as there can be multiple dogs and judges for a competition on a particular date. The competition can be held at multiple venues on the same date. The competition name along with date is unique and has multiple venues for a given date and in addition date itself is a multivalued attribute. At each of these venues on a given date there are many judges and dogs participating. Thus there is only one competition entity for a tuple of participating dogs, judges and venues where the competition is held.

Owned by

1. **Degree** - 2
2. **Participating entities:**
    a. Dog
    b. Owner

3. **Identifying and existence relationship for owner entity type**
4. **Cardinality constraints:**
    a. Dog: Owner = 1:1- each owner is allowed to enter only with one dog per year, they may participate in multiple competitions

Sponsored by

1. **Degree** – 2
2. **Participating entities:**
    a. Competition
    b. Sponsor
3. **Cardinality constraints:**
    a. Competition: Sponsor = N:1- each competition can have only one sponsor as per company policy and each sponsor can sponsor multiple competitions

Won by

1. **Degree** – 3
2. **Participating entities:**
    a. Dog
    b. Competition
    c. Venue
3. **Cardinality constraints:**
    a. Dog:Competition:Venue = 1:1:1 – each competition can be held at multiple venues however, every competition held at a particular date at a particular venue can be only won by one dog. Hence this is a degree 3 relationship with cardinality ratio 1:1:1

n>2 Relationships:

1. **Judged By**
    a. **Degree –** 4
    b. Dog:Judge:Venue:Competition = (d,j,v,1)
2. **Won By**
    a. **Degree –** 3
    b. Dog:Competition:Venue = 1:1:1

Functional Requirements

Modifications

Insert:

1. Dog entity type and a list of all its attributes
2. Judge entity type and a list of all its attributes
3. Sponsor entity type and a list of all its attributes
4. Competition entity type and a list of all its attributes
5. Owner entity type and a list of all its attributes in relationship with its dog
6. Venue entity type and a list of all its attributes

Delete:

1. Dog entity type and a list of all its attributes
2. Judge entity type and a list of all its attributes
3. Sponsor entity type and a list of all its attributes
4. Competition entity type and a list of all its attributes
5. Owner entity type and a list of all its attributes in relationship with its dog
6. Venue entity type and a list of all its attributes

Update:

1. Sponsor entity type and a list of all its attributes – updated yearly
2. Competition entity type and a list of all its attributes – updated yearly
3. Venue entity type and a list of all its attributes – updated yearly
4. Corrections in name, phone number and email address for owner entity.
5. Corrections in name, height, weight etc. for dog entity.

Clear Annual Data:

1. Clear annual data such as Dog and Owner entity types yearly as this data is changed every year.

Retrievals

Selection:

1. **Database managers:** Extract the entire data of Dog entity type and a list of all its attributes along with its owner in order to make the certificate.
2. **Event organisers:** Extract information regarding the competition entity type along with its sponsor and a list of all the venues where the event will be.
3. **Event organisers:** Extract information regarding a venue and all the competitions being held at that venue on various dates.
4. **Event organisers:** Extract information regarding judges and all the competitions each judge is responsible for and their respective categories.
5. **Participants:** Access information regarding judges for their respective dog group and competition details regarding the competitions their dog is participating in.

6. **Sponsors:** Obtain a list of all the competitions they are sponsoring and their corresponding venues.

Projection:

1. **Users(participants/ event organisers:** Extract information for a venue by address – including only street address, only city or only state but country field must be specified.
2. **Users(event organisers/ managers):** Extract information regarding a competition by judge.
3. **Users(event organisers / managers):** Obtain competition by the number of participants.
4. **Users(event organisers / managers:** Obtain judges by number of competitions being judged.
5. **Users(Participants / event organisers / managers):** Obtain competitions by date.
6. **Users(event organisers / managers / sponsors):** Obtain competitions by sponsor.

Aggregate:

SUM

1. **Total number of participants:** calculates the total number of participants in all competitions on all dates.
2. **Total number of sponsors**: Calculates the total number of sponsors.
3. **Total number of competitions sponsored by a sponsor:** Calculates the total number of events sponsored by a given sponsor.
4. **Total number of judges:** Calculates the total number of judges for a given dog group.

AVG

1. **Average number of participants per competition.**
2. **Average number of competitions per sponsor.**

Search:

1. **Search for all data by string matching –** a particular entity will be listed if part of their key attribute matches with the search string.
2. **Search by name category-** lists competitions, sponsors, judges if their name attribute matches with the search string.

Analysis:

1. **Event with minimum number of participants:** adds the total number of participants in and compares them to find the event with the minimum number of participants.
2. **Event with maximum number of participants:** adds the total number of participants in and compares them to find the event with the maximum number of participants.
3. **Major sponsors:** finds the top 5 sponsors based on number of competitions hosted.
4. **Co- sponsors:** finds the bottom 5 sponsors based on number of competitions hosted.
5. **Finalist:** The winner of a particular contest on the basis of points acquired by the dog.