Assignment-1

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Introduction: The mini world assigned to us is crufts which is the largest international dog show held by the Kennel club of the UK. They hold competitions on Dog Agility, Flyball , Obedience, Freestyle, Heelwork to music.They also have competitions where they award winning dogs with best in show award ,best in breed, Dog and bitch challenge certificate.Scruffts is another competition held by kennel club specially for cross breed dogs since they cannot qualify for pure breed competitions.During these competitions they also conduct some trade shows where companies come and exhibit their dog related items and services etc. They allow dogs from countries other than the UK to compete providing them a unique ATC (Authority to Compete) number.

Purpose: The main objective of this database is to Store/ retrieve/ analyse or update data about

- various competitions,rules and regulations,venues,judges etc.
- eligibility,category,age,breed,owners etc.of the participating dogs.
- the trade exhibition and exhibitors and their products or services at the trade show.
- Sponsors and advertisers and their advertisements etc
- Accounts & Revenue through Ticket sales,sponsorships etc
- Registered Website Visitors

Users: A database is purposeless without it's users. It exists for the use of various types of users or stakeholders of the organization.A database is used by of course the database managers themselves and also different software apps or website developers and the various end users.The various end users of a database can be classified as Casual End Users,Naive end Users,Sophisticated end users,Stand Alone end users.

Casual end users:Mid and high level Managers of the Organization Kennel club which runs crufts are casual end users who access the database as and when required as part of their day to day job managing the organization.

Naive end users:Dog owners, Visitors, Media, Sponsors, Advertisers, Exhibitors,Vets,Ticket Buyers are the naive end users who are given access to relevant data through the Crufts website.

Sophisticated end users: The business analysts and strategists and planners of Crufts and Kennel club are the sophisticated end users who have access to almost every aspect of the database.

Standalone end users:Standalone end users use a specific software package to maintain a specific database.For example an Accountant using an accounts software to maintain accounts of the organization or HR staff maintaining the records of employees of the organization using a software designed for that purpose.

Applications: Crufts website uses many applications on the database to provide data from its database to users and also takes in data from forms filled by users on the website to update or insert into the database.

The applications that are using database on this website are:

- Application to Sign up for crufts news.
  - provides the latest news to the community which signed up with this option on the website.
- Application to search for stand numbers in trade shows.
  - There is one such on the website where we can search all stand numbers and their details which show only food items or show dog kennels etc..
- Application to Provide data about competitions.
  - Which includes list of participants (dogs, their owners,..etc) according to their ranks in the competition
  - Should be able to search for any competition any year and any rank..
- Application to Buy tickets for shows
  - Which accesses the database to insert a new ticket buyer details.
  - On this database the kennel club may have other applications which may show how many people bought tickets and maps with colors representing the number of people from a country etc.

The other possible applications (not shown on this crufts website) are :

Applications for the Dog Owners

- to access their dogs' information and update it.
- to see what competitions their dogs are eligible to compete in.

Database Requirements: Entities,Weak Entities,Relationships

Entities: The following are some entities in Crufts Database

1. Contests_table
   a. contest_name (VARCHAR(30))
   b. contest_id (INT)
   c. contest_date (composite attribute : {DAY, MONTH, YEAR})
   d. Number_of_visitors (BIGINT)
   e. No_of_participants (INT)
2. Contests
   a. Dog_id (BIGINT)

   b. Dog_name (VARCHAR (30))
   c. Owner_name (VARCHAR(30))
   d. Rank (INT , NULL(initially))
3. Market_place
   a. Item_type (multivalued attribute: {magazines/books, dog food, kennel, ...etc})
   b. Exhibitor_company_name (VARCHAR (30))
   c. Stand_number (composite attribute : {from, to} both INT)
4. Sponsors
   a. Company_name (VARCHAR (30))
   b. Title (VARCHAR (30))
   c. Logo_link (VARCHAR (255))
   d. Website_link (VARCHAR (255))
   e. Date_of_join (composite attribute : {DAY, MONTH, YEAR})
   f. Date_of_withdrawl (composite attribute : {DAY, MONTH, YEAR} or NULL)
   g. Active (ENUM: {1, 0 })
5. Signed_up_community (people who want latest news)
   a. Name (composite : {fname, lname} VARCHAR(20))
   b. Email (VARCHAR (255))
6. Ticket
   a. Ticket_id (BIGINT)
   b. Buyer_id (BIGINT)
7. Ticket_buyers
   a. Name (VARCHAR(20))
   b. Buyer_id (BIGINT)
   c. Address (composite: {H.NO, street, city, state, country})
8. Registered_dogs
   a. Dog_id (BIGINT)
   b. Dog_name (VARCHAR(20))
   c. Owner_name (composite attribute: {fname, name, lname})
   d. Address (composite: {H.NO, street, city, state, country})
   e. Date_of_birth (composite attribute : {DAY, MONTH, YEAR})
   f. Height (FLOAT)
   g. Weight (FLOAT)
   h. registered _date (composite attribute : {DAY, MONTH, YEAR})

Weak entities: The following are some weak entities in Crufts Database

Ticket_buyers : Here the attributes are not enough to distinguish ticket buyers from one competition to another. Hence we need the contest_id to identify ticket buyers uniquely from this year to last year.

Contests : Here we need contest_id from contest_table to uniquely identify the contests.

Ticket : Here the attributes are not enough to distinguish tickets from one competition to another. Hence we need the contest_id to identify tickets uniquely from contest to contest.

Relationships: The following are some relationships in Crufts Database

1. Sponsors **sponsor** contests
   a. Degree of relationship is 2 (binary Type of relationship).
   b. Cardinality ratio m:n .
   c. (min, max) constraints (1, m) --- (1, n).
2. Registered dogs **participate_in** contests.
   a. Degree of relationship is 2 (binary Type of relationship).
   b. Cardinality ratio m:n .
   c. (min, max) constraints (m, n) --- (1,p).
3. Companies **sell_at** market places.
   a. Degree of relationship is 2 (binary Type of relationship).
   b. Cardinality ratio 1:m .
   c. (min, max) constraints (m, n) --- (1,p)
4. Dog owner **owns** a dog
   a. Degree of relationship is 2 (binary Type of relationship).
   b. Cardinality ratio 1:1
   c. (min, max) constraints (1, 1) --- (1, 1)

d. If a dog owner has many dogs then he has to register each one separately.

n>=3 Relationships:

1. Ticket buyers **buy** tickets for a contest.
    a. Degree of relationship is 3 (Ternary Type of relationship).
    b. Cardinality ratio (1 : m : 1).
    c. (min, max) constraints (1, 1) --- (1, m) -- (1, 1).
    d. Each ticket buyer buys m tickets for a contest .

Functional Requirements: Modifications, Retrievals

Modifications:

Below are a few examples of some modifications

1. Insert:
    a. Insert new participants into the contests table.
    b. Add a new entry in signup for the community table.
    c. Insert a new sponsor in the sponsors table.
    d. Insert a new trade exhibitor in the market place table.
    e. Add a new contest to the contests table.
2. Delete:
    a. Remove a sponsor from the sponsors table.
    b. Remove an exhibitor from the market place table if the exhibitor withdraws.
    c. Remove the ticket buyer from the ticket_buyer table if he cancels his ticket.
    d. Remove a person from the sign up community table if the person doesn't want any latest news updates.
3. Update:
    a. Add a new item to item types.
    b. Remove an item from item types.
    c. Update the sponsor's website links.
    d. Update the dog's height and weight.

Retrievals:

Below are a few examples of some retrievals.

1. Selections:
    a. Get a list of all participants who participated in
    b. Get a list of all the participating dogs.
    c. Get a list of all sponsors who sponsored etc.
2. Projections:
    a. Get the list of data tuples from the contest table where rank<=10.
    b. Get a list of all sponsors who sponsored more than one contest this year.
    c. Names of countries from which at least 10% of visitors/ticket_buyers are native to.
3. Aggregates:
    a. Get the contest names where the maximum number of dogs participated i.e There are a maximum number of entries in the contest table.
    b. Get the contest names where the minimum number of dogs participated i.e There are a minimum number of entries in the contest table.
    c. What is the average number of ticket buyers for all contests that happened this year.
4. Searches:
    a. Get all dog names which match a given string.
    b. Get a list of all dogs from a country whose name starts with 'IN' .
    c. Get a list of all dogs with ranks between x and y in a particular contest.
5. Analysis:
    a. Increase or decrease in Participation and Ticket Sales
    b. Increase or decrease in Revenue
    c. Increase or decrease in visitors to the website.
    d. Impact of covid