ICS321 – Project # 1
Horse Racing Database System
(Due Date – October 18, 2025)

Project Description

In this project, you will work on a **Horse Racing Database System**. The database description and the DDL/DML statements are given in the Appendix.

System Implementation

Develop a system with a simple user interface that implements the limited requirements below:

Database Users

- Admin
- Guest

Functions - Admin

- Add a new race with the results of the race.
- Delete an owner and all the related information from the database.
- Given the horse ID, move the horse from one stable to another.
- Approve a new trainer to join a stable.

Functions – Guest

- Browse the names and ages of horses and the names of their trainer that are owned by people given their last name as input.
- Browse the first and last names of trainers who have trained winners (i.e., horses who have won first place). The column headers should include the details of the trainer, winning horse and the winning race.
- Browse the first and last name of the trainer and the total amount of winnings in terms of prize money for each trainer. The results should be sorted by winnings.
- List the tracks and the count of races held on the track and the total number of horses participating in races on the track.

Additional Requirement

1. Use appropriate API(s) wherever needed.
2. Using Procedural SQL, you must also implement
   i. a stored procedure to delete an owner all the related information from the database.
   ii. a trigger to copy all the horse information to an old_info table whenever a horse is deleted.

Appendix

DDL & DML Definitions

In this project, you will be working with a database containing horse racing information. Use MySQL latest versions for the project. The database has the following structure:

```
Horse(horseId, horseName, age, gender, registration, stableId)
Owner(ownerId, lname, fname)
Owns(horseId, ownerId)
Stable(stableId, stableName, location, colors)
Trainer(trainerId, lname, fname, stableId)
Race(raceId, raceName, trackName, raceDate, raceTime)
RaceResults(raceId, horseId, results, prize)
Track(trackName, location, length)
```

The database is defined by the following constraints/rules:

   Horse gender is designated by:

   F - filly (young female)

   C - colt (young male)

   M - mare (older female)

   S - stallion (older male)

   G - gelding (older neutered male)

   Owners may own multiple horses at multiple different stables.

   Horses may be owned by multiple different owners.

   A single stable contains multiple horses.

   Trainers work for a single stable.

   A stable may employ multiple trainers.

   A horse may race in multiple races.

   A race may contain multiple horses.

   A trainer may also be an owner.

The relational schema with all **DDL/DML statements** is given below. .

RACING Database

```
create table Stable
    (stableId varchar(15) not null,
     stableName varchar(30),
     location varchar(30),
     colors   varchar(20),
     primary key (stableId));
```

```sql
create table Horse
    (horseId  varchar(15) not null,
     horseName  varchar(15) not null,
     age  int,
     gender char,
     registration  integer not null,
     stableId varchar(30) not null,
     foreign key(stableId) references Stable(stableId),
     primary key(horseId));

create table Owner
    (ownerId varchar(15) not null,
     lname   varchar(15),
     fname   varchar(15),
     primary key(ownerId));

create table Owns
    (ownerId varchar(15) not null,
     horseId varchar(15) not null,
     primary key(ownerId, horseId),
     foreign key(ownerId) references Owner(ownerId),
     foreign key(horseId) references Horse(horseId));

create table Trainer
    (trainerId varchar(15) not null,
     lname varchar(30),
     fname varchar(30),
     stableId varchar(30),
     primary key(trainerId),
     foreign key(stableId) references Stable(stableId));

create table Track
    (trackName varchar(30) not null,
     location    varchar(30),
     length      integer,
     primary key(trackName));

create table Race
    (raceId varchar(15) not null,
     raceName varchar(30),
     trackName varchar(30),
     raceDate date,
     raceTime time,
     primary key(raceId),
     foreign key (trackName) references Track(trackName));

create table RaceResults
    (raceId varchar(15) not null,
     horseId varchar(15) not null,
     results  varchar(15),
     prize    float(10,2),
     primary key (raceId, horseId),
     foreign key(raceId) references Race(raceId),
     foreign key(horseId) references Horse(horseId));
```

```
/* Add data to tables. */
/* Stables first */
insert into Stable values ('stable1', 'Zobair Farm', 'Riyadh', 'orange');
insert into Stable values ('stable2', 'Zayed Farm', 'Dubai', 'kiwi');
insert into Stable values ('stable3', 'Zahra Farm', 'Jeddah', 'cinnamon');
insert into Stable values ('stable4', 'Sunny Stables', 'Jubail', 'lemon');
insert into Stable values ('stable5', 'Ajman Stables', 'Ajman', 'lemon');
insert into Stable values ('stable6', 'Dubai Stables', 'Dubai', 'bright
blue');

insert into Horse values ('horse1', 'Warrior', 2, 'C', '11111', 'stable1');
insert into Horse values ('horse2', 'Conquerer', 2, 'F', '22222', 'stable6');
insert into Horse values ('horse3', 'Dove of Peace', 3, 'C', '33333',
'stable1');
insert into Horse values ('horse4', 'Ever Faster', 3, 'F', '44444',
'stable3');
insert into Horse values ('horse5', 'Slow Winner', 2, 'C', '55555',
'stable3');
insert into Horse values ('horse6', 'Windrunner', 2, 'F', '66666',
'stable2');
insert into Horse values ('horse7', 'Catapult', 4, 'M', '77777', 'stable6');
insert into Horse values ('horse8', 'Flying Force', 2, 'C', '88888',
'stable4');
insert into Horse values ('horse9', 'Laggard', 2, 'F', '99999', 'stable4');
insert into Horse values ('horse10', 'Formula One', 6, 'G', '10101',
'stable2');
insert into Horse values ('horse11', 'Frisky Frolic', 3, 'C', '11011',
'stable4');
insert into Horse values ('horse12', 'Fantastic', 3, 'F', '12121',
'stable2');
insert into Horse values ('horse13', 'Midnight', 2, 'C', '13131', 'stable3');
insert into Horse values ('horse14', 'Running Wild', 4, 'S', '14141',
'stable2');
insert into Horse values ('horse15', 'FastOffMyFeet', 3, 'C', '15151',
'stable1');
insert into Horse values ('horse16', 'Slow Poke', 2, 'C', '16161',
'stable3');
insert into Horse values ('horse17', 'Slinger', 3, 'F', '17171', 'stable2');
insert into Horse values ('horse18', 'Sublime', 5, 'M', '18181', 'stable6');
insert into Horse values ('horse19', 'Front Runner', 4, 'G', '19191',
'stable4');
insert into Horse values ('horse20', 'Night', 3, 'C', '20200', 'stable1');
insert into Horse values ('horse21', 'Negative', 3, 'F', '21210', 'stable3');
insert into Horse values ('horse22', 'Lightening', 2, 'C', '22220',
'stable6');
insert into Horse values ('horse23', 'Lazy Loser', 4, 'G', '23230',
'stable1');
insert into Horse values ('horse24', 'Leaping Lizard', 2, 'C', '24240',
'stable1');
insert into Horse values ('horse25', 'Beautiful Brown  ', 3, 'F', '25250',
'stable6');
insert into Horse values ('horse26', 'Sick Winner', 5, 'M', '26260',
'stable2');

insert into Owner values('owner1', 'Saeed', 'Ahmed');
insert into Owner values('owner2', 'Mohammed', 'Khalid');
insert into Owner values('owner3', 'Mohammed', 'Faisal');
```

```sql
insert into Owner values('owner4', 'Fahd', 'Abdul Rahman');
insert into Owner values('owner5', 'Nasr', '');
insert into Owner values('owner6', 'Mohammed', 'Sheikh');
insert into Owner values('owner7', 'Abed', 'Ahmed');
insert into Owner values('owner8', 'Mashour', '');
insert into Owner values('owner9', 'Said', 'Sheikh');
insert into Owner values('owner10', 'Faisal', 'Khan');
insert into Owner values('owner11', 'Jabr', 'Mohammed');
insert into Owner values('owner12', 'Faleh', 'Mahmood');
insert into Owner values('owner13', 'Yahya', 'Mohammed');
insert into Owner values('owner14', 'Sulaiman', '');
insert into Owner values('owner15', 'Saeed', 'Ali');
insert into Owner values('owner16', 'Ahmed', 'Faisal');
insert into Owner values('owner17', 'Saud', 'Mohammed');
insert into Owner values('owner18', 'Nazir', 'Mohammed');
insert into Owner values('owner19', 'Saleh', 'Fahd');
insert into Owner values('owner20', 'Mohammed', 'Naeem');

insert into Owns values('owner14', 'horse1');
insert into Owns values('owner3', 'horse2');
insert into Owns values('owner2', 'horse3');
insert into Owns values('owner2', 'horse4');
insert into Owns values('owner1', 'horse5');
insert into Owns values('owner12', 'horse5');
insert into Owns values('owner14', 'horse5');
insert into Owns values('owner1', 'horse6');
insert into Owns values('owner5', 'horse6');
insert into Owns values('owner20', 'horse7');
insert into Owns values('owner19', 'horse8');
insert into Owns values('owner2', 'horse9');
insert into Owns values('owner18', 'horse10');
insert into Owns values('owner3', 'horse10');
insert into Owns values('owner4', 'horse11');
insert into Owns values('owner16', 'horse12');
insert into Owns values('owner17', 'horse13');
insert into Owns values('owner15', 'horse14');
insert into Owns values('owner15', 'horse15');
insert into Owns values('owner20', 'horse16');
insert into Owns values('owner4', 'horse17');
insert into Owns values('owner6', 'horse19');
insert into Owns values('owner12', 'horse20');
insert into Owns values('owner7', 'horse21');
insert into Owns values('owner7', 'horse22');
insert into Owns values('owner10', 'horse23');
insert into Owns values('owner12', 'horse24');
insert into Owns values('owner13', 'horse25');
insert into Owns values('owner2', 'horse26');
insert into Owns values('owner9', 'horse23');
insert into Owns values('owner8', 'horse18');

insert into Trainer values('trainer1', 'Mohammed', 'Fahd', 'stable2');
insert into Trainer values('trainer2', 'Saleh', 'Saeed', 'stable1');
insert into Trainer values('trainer3', 'Ali', 'Raad', 'stable4');
insert into Trainer values('trainer4', 'Sayed', 'Wasim', 'stable3');
insert into Trainer values('trainer5', 'Ahmed', 'Ali', 'stable3');
insert into Trainer values('trainer6', 'Faisal', 'Salah', 'stable5');
insert into Trainer values('trainer7', 'Hamid', 'Ahmed', 'stable6');
```

```sql
insert into Trainer values('trainer8', 'Khalid', 'Ahmed', 'stable6');

insert into Track values('Doha', 'QT', 20);
insert into Track values('Jubail', 'SA', 15);
insert into Track values('Yanbu', 'SA', 18);
insert into Track values('Dubai', 'UE', 17);
insert into Track values('Jeddah', 'SA', 19);
insert into Track values('Bahrain', 'BH', 18);
insert into Track values('Sharjah', 'UE', 20);
insert into Track values('Riyadh', 'SA', 22);
insert into Track values('Dhahran', 'SA', 20);

insert into Race values('race1', 'Kings Cup', 'Riyadh', '2007-05-
03','14:00');
insert into Race values('race2', '2-year-old fillies', 'Doha', '2007-05-
03','13:00');
insert into Race values('race3', '2-year-old colts', 'Doha', '2007-05-
03','13:30');
insert into Race values('race4', 'Handicap', 'Doha', '2007-05-03','12:00');
insert into Race values('race5', 'Claiming Stake', 'Sharjah', '2007-05-
03','12:30');
insert into Race values('race6', '3-year-old fillies', 'Jubail', '2007-06-
02','12:30');
insert into Race values('race7', 'Handicap', 'Jubail', '2007-06-02','9:30');
insert into Race values('race8', '2-year-old colts', 'Riyadh', '2007-06-
02','10:30');
insert into Race values('race9', '2-year-old fillies', 'Jubail', '2007-06-
02','11:30');
insert into Race values('race10', 'Claiming Stake', 'Sharjah', '2007-06-
02','12:30');
insert into Race values('race11', '3-year-old fillies', 'Dubai', '2007-04-
02','10:30');
insert into Race values('race12', 'Handicap', 'Yanbu', '2007-05-03','11:30');
insert into Race values('race13', '3-year-old fillies', 'Yanbu', '2007-05-
03','11:00');
insert into Race values('race14', 'Handicap', 'Dhahran', '2007-05-
10','10:00');
insert into Race values('race15', '3-year-old colts', 'Dubai', '2007-05-
12','15:00');
insert into Race values('race16', 'Claiming Stake', 'Yanbu', '2007-05-
20','14:30');
insert into Race values('race17', 'Handicap', 'Doha', '2007-05-20','13:00');
insert into Race values('race18', '3-year-old fillies', 'Sharjah', '2007-05-
21','8:00');
insert into Race values('race19', '2-year-old colts', 'Dhahran', '2007-05-
25','11:00');
insert into Race values('race20', 'Claiming Stake', 'Jeddah', '2007-05-
25','8:30');
insert into Race values('race21', '3-year-old colts', 'Riyadh', '2007-03-
19','14:30');
insert into Race values('race22', 'Handicap', 'Dhahran', '2007-03-
27','15:00');
insert into Race values('race23', '3-year-old fillies', 'Jeddah', '2007-03-
28','9:30');
insert into Race values('race24', '3-year-old colts', 'Jubail', '2007-03-
28','13:30');
```

```
insert into Race values('race25', 'Claiming Stake', 'Jeddah', '2007-03-
29','10:00');
insert into Race values('race26', '3-year-old colts', 'Yanbu', '2007-03-
30','12:30');
insert into Race values('race27', 'Handicap', 'Dubai', '2007-04-03','14:00');
insert into Race values('race28', '2-year-old fillies', 'Jeddah', '2007-04-
04','8:30');
insert into Race values('race29', '3-year-old colts', 'Bahrain', '2007-04-
05','8:00');
insert into Race values('race30', 'Claiming Stake', 'Dhahran', '2007-04-
08','9:30');
insert into Race values('race31', 'Handicap', 'Dhahran', '2007-04-
08','9:00');
insert into Race values('race32', '2-year-old colts', 'Jubail', '2007-04-
09','11:00');
insert into Race values('race33', 'Claiming Stake', 'Bahrain', '2007-04-
10','13:00');
insert into Race values('race34', '3-year-old colts', 'Dubai', '2007-05-
12','12:00');
insert into Race values('race35', 'Handicap', 'Dubai', '2007-04-13','10:30');
insert into Race values('race36', '3-year-old colts', 'Jeddah', '2007-05-
03','14:30');

insert into RaceResults values('race1', 'horse3', 'first', 500000);
insert into RaceResults values('race1', 'horse11', 'second', 200000);
insert into RaceResults values('race1', 'horse15', 'third', 500000);
insert into RaceResults values('race2', 'horse6', 'first', 100000);
insert into RaceResults values('race2', 'horse2', 'second', 50000);
insert into RaceResults values('race2', 'horse20', 'third', 20000);
insert into RaceResults values('race3', 'horse22', 'first', 70000);
insert into RaceResults values('race3', 'horse5', 'second', 50000);
insert into RaceResults values('race3', 'horse1', 'third', 20000);
insert into RaceResults values('race4', 'horse19', 'first', 50000);
insert into RaceResults values('race4', 'horse18', 'no show', 0);
insert into RaceResults values('race4', 'horse14', 'no show', 0);
insert into RaceResults values('race6', 'horse25', 'first', 5000);
insert into RaceResults values('race7', 'horse7', 'second', 2000);
insert into RaceResults values('race9', 'horse11', 'last', 0);
insert into RaceResults values('race10', 'horse18', 'fourth', 500);
insert into RaceResults values('race11', 'horse12', 'first', 50000);
insert into RaceResults values('race11', 'horse17', 'second',25000);
insert into RaceResults values('race11', 'horse21', 'fourth', 10000);
insert into RaceResults values('race12', 'horse14', 'first', 6000);
insert into RaceResults values('race12', 'horse18', 'second', 5000);
insert into RaceResults values('race13', 'horse25', 'first', 100000);
insert into RaceResults values('race13', 'horse4', 'second', 50000);
insert into RaceResults values('race13', 'horse12', 'third', 30000);
insert into RaceResults values('race14', 'horse23', 'first', 25000);
insert into RaceResults values('race14', 'horse26', 'second', 20000);
insert into RaceResults values('race15', 'horse11', 'second', 10000);
insert into RaceResults values('race15', 'horse24', 'third', 8000);
insert into RaceResults values('race16', 'horse10', 'second', 5000);
insert into RaceResults values('race16', 'horse14', 'third', 4000);
insert into RaceResults values('race17', 'horse7', 'first', 15000);
insert into RaceResults values('race17', 'horse10', 'second',1100);
insert into RaceResults values('race18', 'horse6', 'first', 70000);
insert into RaceResults values('race19', 'horse22', 'first', 1000000);
```

```sql
insert into RaceResults values('race19', 'horse1', 'second', 80000);
insert into RaceResults values('race19', 'horse8', 'third', 60000);
insert into RaceResults values('race20', 'horse23', 'first', 1500);
insert into RaceResults values('race20', 'horse14', 'second', 1000);
insert into RaceResults values('race20', 'horse26', 'third', 800);
insert into RaceResults values('race20', 'horse10', 'fourth', 500);
insert into RaceResults values('race21', 'horse24', 'first', 70000);
insert into RaceResults values('race21', 'horse15', 'second', 55000);
insert into RaceResults values('race21', 'horse3', 'third', 40000);
insert into RaceResults values('race22', 'horse18', 'first', 10000);
insert into RaceResults values('race22', 'horse19', 'second', 8000);
insert into RaceResults values('race23', 'horse25', 'first', 150000 );
insert into RaceResults values('race24', 'horse7', 'first', 10000);
insert into RaceResults values('race25', 'horse10', 'second', 8000);
insert into RaceResults values('race25', 'horse20', 'fourth', 2000);
insert into RaceResults values('race26', 'horse24', 'first', 8000);
insert into RaceResults values('race26', 'horse20', 'fourth', 2000);
insert into RaceResults values('race27', 'horse18', 'first', 70000);
insert into RaceResults values('race27', 'horse23', 'third', 40000);
insert into RaceResults values('race28', 'horse25', 'first', 90000);
insert into RaceResults values('race29', 'horse15', 'first', 80000);
insert into RaceResults values('race29', 'horse3', 'second', 65000);
insert into RaceResults values('race29', 'horse24', 'third', 50000);
insert into RaceResults values('race30', 'horse14', 'second', 1500);
insert into RaceResults values('race30', 'horse10', 'fourth', 500);
insert into RaceResults values('race31', 'horse7', 'first', 90000);
insert into RaceResults values('race31', 'horse26', 'second', 70000);
insert into RaceResults values('race31', 'horse23', 'third', 50000);
insert into RaceResults values('race31', 'horse10', 'fourth', 30000);
insert into RaceResults values('race32', 'horse22', 'first', 150000);
insert into RaceResults values('race32', 'horse13', 'second', 125000);
insert into RaceResults values('race32', 'horse16', 'third', 100000);
insert into RaceResults values('race33', 'horse23', 'second', 1700);
insert into RaceResults values('race33', 'horse26', 'third', 1200);
insert into RaceResults values('race34', 'horse11', 'first', 50000);
insert into RaceResults values('race34', 'horse15', 'second', 30000);
insert into RaceResults values('race35', 'horse7', 'first', 45000);
insert into RaceResults values('race35', 'horse19', 'second', 25000);
insert into RaceResults values('race36', 'horse11', 'first', 100000);
insert into RaceResults values('race36', 'horse15', 'second', 80000);
insert into RaceResults values('race36', 'horse20', 'third', 50000);
```