ASSIGNMENT 1

EECS 3421

INTRODUCTION TO DATABASE MANAGEMENT

Team (1 member)

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PART 1: ADDITIONAL INTEGRITY CONSTRAINTS

1. No player can play against themselves.

#### QUERY: σ playerA = playerB(Event) = ∅

#### All vouchers for an event have to be purchased before the time of the event.

#### QUERY: σ Voucher.dateIssued < Event.date(Voucher ⨝ Voucher.EID = Event.EID(Event))

#### The number of vouchers purchased for an event should not exceed the capacity of the court where the event takes place.

#### QUERY: Cannot be expressed.

#### There exist players who have never played in any event.

#### QUERY: π PIDPlayer - (π PID(Event ⨝ playerA = PIDPlayer)) - (π PID(Event ⨝ playerB = PIDPlayer)) ≠ ∅

#### A tournament’s slam should be one of ‘AO’, ‘FO’, ‘UO’, or ‘W’ representing each of the Australian Open, French Open, U.S. Open, and Wimbledon Grant Slams.

#### QUERY: σ slam ≠ 'AO' and slam ≠ 'FO' and slam ≠ 'UO' and slam ≠ 'W'(Tournament) = ∅ (Note: “and” can be replaced with ∧)

**PART 2: QUERIES**

1. Report the first and last name of the player that has competed in every court. If there are ties report all of them.

#### QUERY: R1:= (Player ⨝ PID = playerAEvent) ∪ (Player ⨝ PID = playerBEvent)

#### R2:= Event ⨝ courtID = CIDCourt

#### R3:= π fname,lname ( R1/R2 ) (Note : Or R1 – ((R1 X R2) – R1))

#### Final Query = R3

1. Report the EID of the event for which the highest number of vouchers were purchased. If there are ties report all of them

**QUERY:** Cannot be expressed.

1. Report the name(s) of the countries that had players who didn’t play in any event.

#### QUERY: R1:= (Player ⨝ PID = playerAEvent) ∪ (Player ⨝ PID = playerBEvent)

#### R2:= π PID (R1)

#### R3:= ( π PID,ctryID (Player) – R2 )

#### Final Query : π name(Country ⨝ CTRYID = ctryIDPlayer)

#### Report the CID(s) and name of the court(s) where exactly one event took place

**QUERY:**  R1:= ρ E1(Event)

R2:= ρ E2(Event)

R3:= R1⋈E1.courtID=E2.courtID AND E1.EID ≠ E2.EID R2

// Comment: Finding all courts with more than one events.

R4:= π courtID (Event) – ((π courtID (Event) x π courtID(R3)) – π courtID (Event))

// Comment: doing Division. Will give us one event in one court.

#### Final Query: π CID,name ( Court ⋈CID=courtID  R4 )

#### 

#### Report the countries of the players with the highest difference in the number of sets won when competed with each other at an event. If there are ties, report all of them.

#### QUERY: Cannot be expressed. //Comment : As we cannot subtract two values to find difference.

#### 

#### Report the PID of the player(s) who have played in the court(s) with the largest capacity

#### R1: = π Court.CID (σ  C1.capacity > Court.capacity(Court ⨯ ρ C1(Court)))

#### R2 : = π CID (Court) – R1 // Comment: Will give largest value

#### R3: = R2 ⨝ CID = courtID (Event)

#### R4:= R3 ⨝ playerA = PID(Player)

#### R5:= R3 ⨝ playerB = PID(Player)

#### Final Query: π PID R4  ∪ π PID R5

1. Find the winning country of the event for which the very first voucher out of all the vouchers in the database were purchased.

#### R1: = π V1.VID (σ  V1.dateIssued > dateIssued(Voucher ⨯ ρ V1(Voucher)))

#### R2 : = π EID (Voucher) – R1 // Comment: Will give first date

#### R3: = R2 ⨝ EID = EID(Event)

#### R4:= π PID(σ playerA > playerB(R3)) ∪ π PID( σ playerB > playerA(R3))

#### R5 := π ctryID( R3 ⨝ R3.PID = PID(Player))

#### Final Query: π name ( R5  ⨝ ctryID = CTRYID (Country)

#### 

#### Report the first and last name of the player of the country ‘Canada’ with the second highest number of total points among players of the same country.

#### QUERY: Cannot be expressed. //Comment : As we cannot find Second highest.

#### Report the EID(s) of the events for which at least two vouchers were bought on the date of the event.

#### QUERY: R1: = π EID(σ  date=dateIssued(Voucher ⨝ Voucher.EID= Event.EID(Event)))

#### // getting all the voucher bought on the date of the event.

#### R2:= π EID,EID2 (R1 ⨯ ρ EID2(Event))

#### Final Query: π EID (σ  EID ≠ EID2(R2 ))