

Course Number	CPS510
Course Title	Database Systems I
Semester/Year	F2022
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Section No.	03
Submission Date	02-December-2022
Due Date	02-December-2022

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Crew (CrewName, Occupation, Age)  
 info(city\_name, location\_address, date\_time)  
 Coach(Age, CoachName, CoachTeam, CoachRecord, CoachCountry)  
 teams(numberof\_wins, numberof\_lost int, country\_name, TeamName, matplayed, points, numbeof\_goal,  
CoachName)  
 Players (PlayerNum, PlayerName, PlayerPosition, NumOfRedCards, NumOfYellowCards, Goals, Fouls,  
TeamName)

## Join Queries

```
SELECT TEAMS.numberof_wins, TEAMS.numberof_lost, TEAMS.matplayed, Coach.CoachRecord,
Coach.CoachName
FROM TEAMS
LEFT JOIN COACH ON (TEAMS.TeamName != COACH.CoachCountry) AND ((Coach.CoachTeam =
TEAMS.TEAMNAME) AND (TEAMS.numberof_wins > TEAMS.numberof_lost));
```

```
SELECT TEAMS.country_name, TEAMS.numberof_wins, TEAMS.numberof_lost,  
PLAYERS.PlayerName, PLAYERS.goals, PLAYERS.PlayerPosition  
FROM TEAMS  
INNER JOIN PLAYERS  
ON PLAYERS.Team_Name = TEAMS.TeamName;
```

### **Views**

```
CREATE VIEW TopScorers AS  
SELECT PLAYERNAME, GOALS  
FROM PLAYERS  
ORDER BY GOALS DESC ;
```

```
CREATE VIEW TopRedCards AS  
SELECT DISTINCT PLAYERNAME, NumOfRedCards  
FROM PLAYERS  
ORDER BY NumOfRedCards DESC ;
```

```
CREATE VIEW TeamslostAlot AS  
SELECT country_name, TeamName, numberof_wins  
FROM TEAMS  
WHERE numberof_wins<numberof_lost;
```

Unix shell Implementation:

```

SELECT playerName, Goals
FROM Players
WHERE EXISTS
(SELECT TeamName FROM Teams WHERE points > '3');

```

Query Result x

SQL | All Rows Fetched: 12 in 0.072

PLAYERNAME	GOALS
1 Lionel Messi	25
2 Timo Werner	5
3 Phil Foden	1
4 Alphonso Davies	3
5 Mo Salah	35
6 Erling Haaland	5
7 Robert Lewandowski	8
8 Kylian Mbappe	10
9 Kevin De Bruyne	1
10 Karim Benzema	3
11 Christian Pulisic	0
12 Pedri	1

```

SELECT COUNT(playernum), team_name
FROM players
GROUP BY team_name
HAVING COUNT(playernum) > 1;

```

Query Result x

SQL | All Rows Fetched: 1 in 0.009 seconds

COUNT(PLAYERNUM)	TEAM_NAME
1	2 FRA

```

SELECT CoachTeam, CoachCountry FROM Coach
WHERE CoachCountry='Canada'
UNION
SELECT country_name, TeamName FROM teams
WHERE country_name ='Canada'
ORDER BY CoachTeam;

```

Query Result x

SQL | All Rows Fetched: 3 in 0.008 sec

COACHTEAM	COACHCOUNTRY
1 CAN	Canada
2 Canada	CAN
3 FRA	Canada

Main page:

```

aelgochar@thebe:~$ bash menu.sh

```

```

menu.sh: line 10: =====: command not found
Oracle All Inclusive Tool

Main Menu - Select Desired Operation(s):

<CTRL-Z Anytime to Enter Interactive CMD Prompt>

-----

M) View Manual

1) Drop Tables
2) Create Tables
3) Populate Tables
4) Query Tables

X) Force/Stop/Kill Oracle DB

E) End/Exit
Choose:
1

```

Functional Dependencies:

3rd Normal Form:

Normalization 3NF/ BCNF by Algorithm:

Advanced Queries and Views:

```
SELECT CoachTeam, CoachCountry FROM Coach
WHERE CoachCountry='Canada'
UNION
SELECT country_name, TeamName FROM teams
WHERE country_name ='Canada'
ORDER BY CoachTeam;
```

```
SELECT COUNT(Occupation)
From Crew;
```

```
SELECT TeamName
FROM teams
WHERE TeamName = 'GER'
MINUS
SELECT Team_Name
FROM Players;
```

Normalization of the database/ Functional Dependencies:

FD (Crew) - CrewName -> Occupation, Age

FD (info) - city\_name -> location\_address, date\_time

FD (Coach) - CoachName -> Age, CoachTeam, CoachRecord, CoachCountry

FD (teams) - TeamName -> country\_name, numberof\_wins, numberof\_lost, matplayed, points, numbeof\_goals, Coach\_Name

country\_name -> TeamName, numberof\_wins, numberof\_lost, matplayed, points, numbeof\_goals, Coach\_Name

FD (Players) - PlayerNum, PlayerName -> PlayerPosition, NumOfRedCards, NumOfYellowCards, Goals, Fouls, Team\_Name

Normalization / 3NF:

FD (info) - date\_time

city\_name -> location\_address

FD (teams) - TeamName -> country\_name, Coach\_Name

points -> numberof\_wins, numberof\_lost, matplayed, points, numbeof\_goals

country\_name -> TeamName,

Normalization/ BCNF:

FD (Crew) - CrewName -> Occupation, Age

CrewName is an independent attribute that determines all attributes of the table, so this relation is already in BCNF.

FD (info) - city\_name -> location\_address, date\_time

city\_name is an independent attribute that determines all attributes of the table, so this relation is already in BCNF.

FD (Coach) - CoachName -> Age, CoachTeam, CoachRecord, CoachCountry

CoachName and CoachTeam are both primary attributes since they can determine all attributes in the Coach table. These two attributes determine the rest of the attributes with no transitivity. So this relation is already in BCNF.

FD (Players) - PlayerNum, PlayerName  $\rightarrow$  PlayerPosition, NumOfRedCards, NumOfYellowCards, Goals, Fouls, Team\_Name

This relation is already in BCNF.

Compute PlayerNum, PlayerName $+$

= {PlayerNum, PlayerName}

= {PlayerNum, PlayerName, Team\_Name}

= {PlayerNum, PlayerName, Team\_Name, PlayerPosition, NumOfRedCards, NumOfYellowCards, Goals, Fouls}

FD (teams) - TeamName  $\rightarrow$  country\_name, Coach\_Name

points  $\rightarrow$  numberof\_wins, numberof\_lost, matplayed, points, numbeof\_goals

country\_name  $\rightarrow$  TeamName, matplayed

This relation is already in BCNF.

Compute TeamName $+$

= {TeamName}

= {TeamName, country\_name, Coach\_Name, points}

= {TeamName, country\_name, Coach\_Name, points, numberof\_wins, numberof\_lost, matplayed, points, numbeof\_goals}

= {TeamName, country\_name, Coach\_Name, points, numberof\_wins, numberof\_lost, matplayed, points, numbeof\_goals, country\_name, TeamName, matplayed}

GUI:  
Main Page;

Info ☐ Select Info

Crew ☐ Select Crew

Coach ☐ Select Coach

Teams ☐ Select Tea...

Players ☐ Select Play...

Info Database:

CITY_NAME	LOCATION_...	DATE_TIME	MATCH_ID
north york	5 main ave	2023-04-03 0...	1
Toronto	3 Midlean Ave	2022-01-02 0...	2
Toyko	1 Sukushi Ave	2022-03-15 0...	3
Shanghai	3300 Caocha...	2022-06-15 0...	4
New York	3 Washenten...	2022-10-03 0...	5
Nanjing	5 Wuhu ave	2022-05-06 0...	6
Kosaka	26 Bubu Ave	2022-04-25 0...	7
Beijing	563 Zainali St...	2022-02-05 0...	8

Match ID

CityName

Address

Date



Coach Database:

AGE	COACHNAME	COACHTEAM	COACHRECORD	COACHCOUNTRY
56	Vox Akuma	FRA	4520	Canada
49	Roberto ...	BEL	6548	Belgium
55	Shu Yami...	NOR	5642	Norway
64	Gregg Be...	USA	6578	United St...
56	Lionel Sca...	ARG	7456	Argentina
55	Hansi Flick	GER	8242	Germany
64	Gareth So...	ENG	1863	England
54	John Herd...	CAN	6248	Canada

Age

Name

Team

Record

Country

Add

Update

Delete

Crew Database:

CREWNAME	OCCUPATION	AGE
Zhang Chulan	Ticket Guy	27
Zhuge Qing	Geroge Man	26
Wang Ye	Down and Distance	27
Jack West	Ball boy	19
Uki	Rod Man	22
Nijisanji En	Box Man	26
Mysta Rias	Clip Guy	24
Ike Eveland	Down and Distance	27

Name

Occupation

Age

Add

Update

Delete

### Team Database:

NU...	NU...	CO...	TEA...	MAT...	POI...	NUM...	CO...
2	1	Arge...	ARG	3	9	5	Lion...
0	1	Ger...	GER	1	0	2	Han...
0	2	Engl...	ENG	2	0	6	Gar...
2	1	Can...	CAN	3	6	6	John...
2	0	Egypt	EGY	2	6	4	Ali S...
1	3	Pola...	POL	3	6	6	Mike...
0	0	Brazil	BRA	1	0	2	Ben ...
0	0	Nor...	NOR	2	0	6	Shu ...

Wins   
Lost   
Country   
Team   
Match Played   
Goals   
Points   
Coach name

### Player Database:

PLA...	PLA...	PLA...	NU...	NUM...	GO...	FOU...	TEA...
10	Lion...	RW	2	3	25	8	ARG
9	Tim...	CF	0	0	5	11	GER
47	Phil ...	CM	1	0	1	6	ENG
19	Alph...	LB	0	0	3	6	CAN
11	Mo ...	RW	0	2	35	4	EGY
5	Erlin...	CF	0	0	5	11	NOR
8	Rob...	CF	1	0	8	6	POL
7	Kvlia...	ST	3	5	10	4	FRA

Number   
Name   
Position   
Red Cards   
Yellow Cards   
Goals   
Fouls   
Team Name

Codes are provided in the zip file with the submission.