

FANTASY CRICKET TEAM DATABASE

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A hand-drawn diagram of a presentation slide. The slide is a rounded rectangle with a dark blue border. The word 'INTRODUCTION' is written in the center in a dark blue, hand-drawn font. In the top-left corner, there is a green rounded square containing the number '1'. A dark blue arrow starts from the top-right corner of the slide, goes up and left, then down and left, ending at the green square. There are several decorative wavy lines and double lines along the border of the slide.

1

INTRODUCTION

- ❑ **Fantasy Cricket Team Database** is a model of the database used in fantasy gaming platforms like Dream 11, My11Circle etc.
- ❑ This database model is concerned with storing the data of users, playing fantasy cricket.
- ❑ Users play fantasy cricket by creating a fantasy team and participating in a contest. For this :-
 - ❑ User will login into the fantasy sports app (like Dream11) using the login credentials he created.
 - ❑ Chooses a match (example: a match in IPL) and selects the players from both teams to create his fantasy team.
 - ❑ Assigns the role of the captain and the vice captain to two of those 11 players selected in his fantasy team.
 - ❑ Then participates in any no. of contests available in the app using the created fantasy team.



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ENTITY-RELATIONSHIP DIAGRAM

ENTITIES

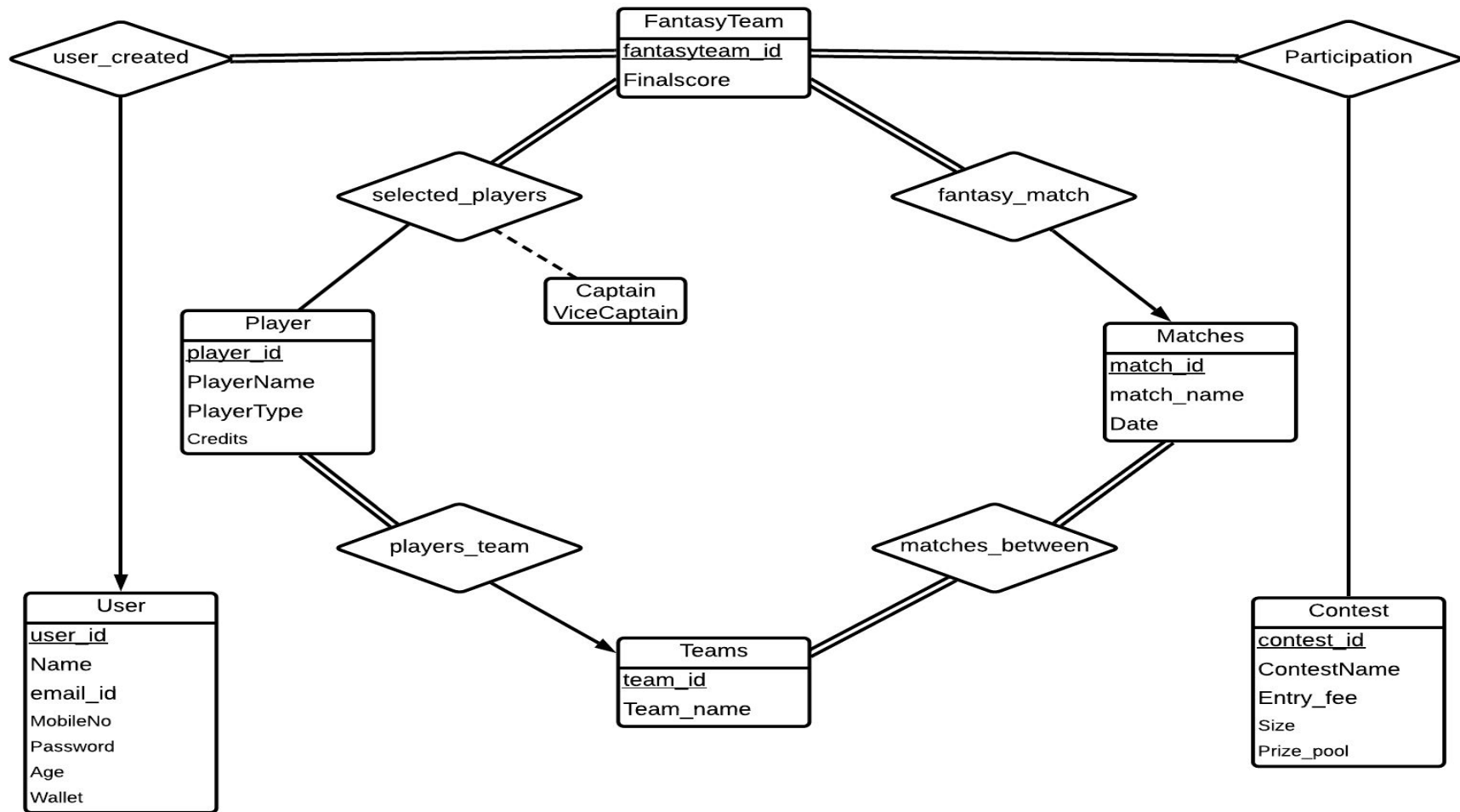
ENTITY	ATTRIBUTES	TYPE
User	<u>user_id</u> , Name, email_id, MobileNo, Password, Age, Wallet	Strong
Teams	<u>team_id</u> , Team_Name	Strong
Players	<u>player_id</u> , PlayerName, Type, Credits	Strong
Matches	<u>match_id</u> , MatchName, Date	Strong
Contests	<u>contest_id</u> , Contestname, Entry_fee, Size, Prize_pool	Strong
FantasyTeam	<u>fantasyteam_id</u> , FinalScore	Strong



RELATIONSHIPS

RELATIONSHIPS	ENTITIES INVOLVED	CARDINALITY
user_created	User, FantasyTeam	one to many
players_team	Players, Teams	many to one
fantasy_match	Matches, FantasyTeam	one to many
matches_between	Teams, Matches	many to many
selected_players	FantasyTeam, Players	many to many
Participation	FantasyTeam, Contest	many to many





A hand-drawn diagram illustrating an initial relation schema. It features a large, rounded rectangular box with a dark blue border. Inside the box, the text "INITIAL RELATION SCHEMA" is written in a dark blue, hand-drawn font. To the left of the box, there is a green, rounded square containing a large, dark blue closing curly brace "}". A dark blue arrow points from the top right corner of the box to the green square. Another dark blue arrow points from the bottom right corner of the box towards the bottom center. The box has a small circle at the top left corner and a wavy line at the top right corner.

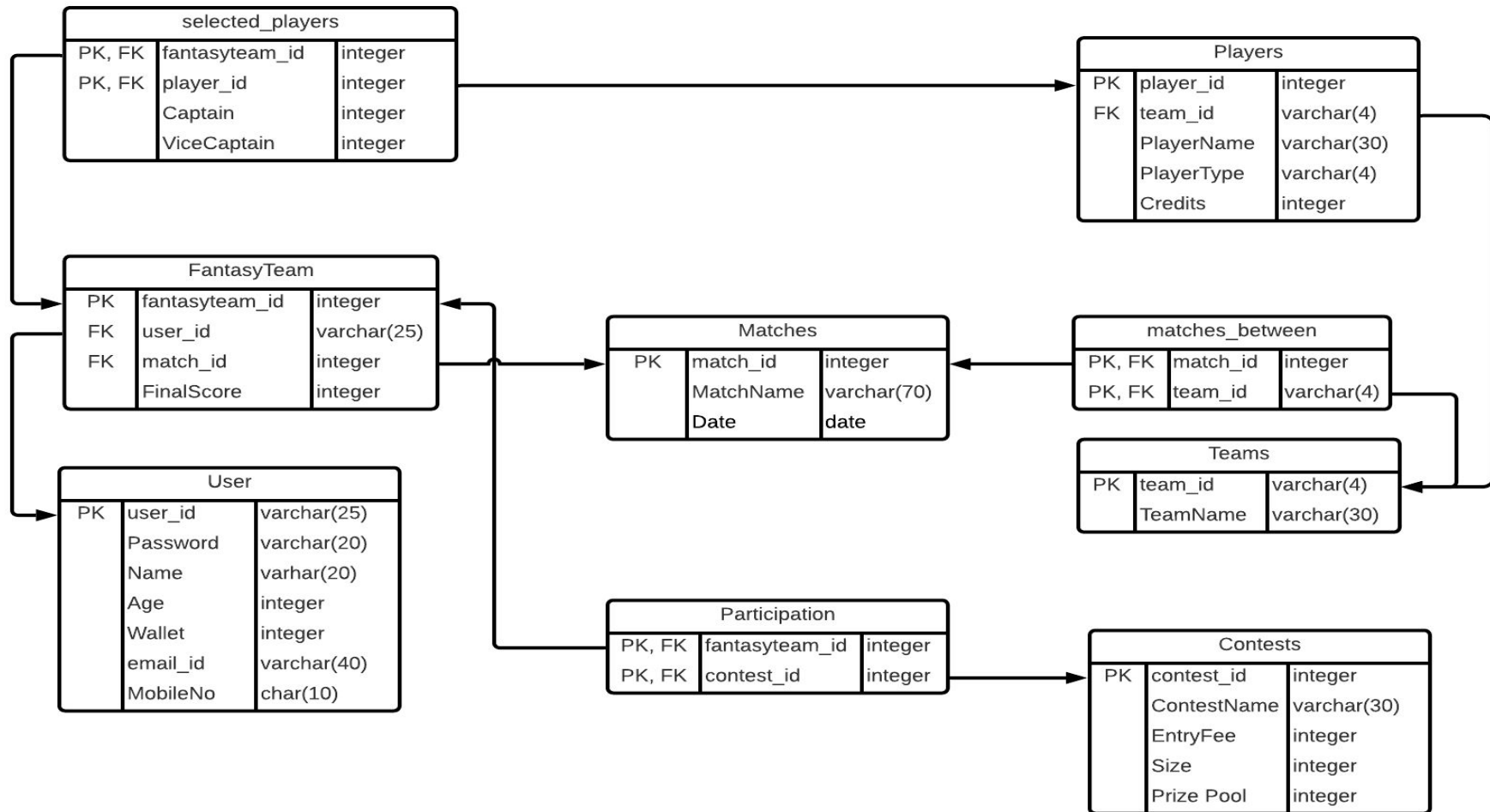
}

INITIAL RELATION SCHEMA

ER DIAGRAM □ RELATION SCHEMA

RELATION	PRIMARY KEY	CREATED FROM
User	user_id	User (entity)
Teams	team_id	Teams (entity)
Player	player_id	Player (entity)
Matches	match_id	Matches (entity)
FantasyTeam	fantasyteam_id	FantasyTeam (entity)
Contest	contest_id	Contest (entity)
selected_players	fantasyteam_id , player_id	selected_players (relationship)
Participation	fantasyteam_id, contest_id	Participation (relationship)
matches_between	match_id, team_id	matches_between (relationship)





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NORMALISATION

FUNCTIONAL DEPENDENCIES IN THE SCHEMA

RELATION	FUNCTIONAL DEPENDENCIES
User	user_id \rightarrow Name, Age, Wallet, email_id, Password, Mobile_no. email_id \rightarrow Name, Age, Wallet, user_id, Password, Mobile_no. MobileNo \rightarrow Name, Age, Wallet, email_id, Password, user_id
Teams	team_id \rightarrow TeamName
Player	player_id \rightarrow PlayerType, PlayerName, Credits, team_id
Matches	match_id \rightarrow MatchName, Date
FantasyTeam	fantasyteam_id \rightarrow user_id, match_id, FinalScore
Contest	Contest_id \rightarrow ContestName, EntryFee, Size, Prizepool EntryFee, Size \rightarrow Prizepool
selected_players	fantasyteam_id, player_id \rightarrow Captain, ViceCaptain



FIRST NORMAL FORM

□ A table is in 1NF iff :

- There are only Single Valued Attributes (Atomic).
- Values stored in a column should be of the same domain.
- All the columns in a table should have unique names.

Relations in 1NF	User, Teams, Player, Matches, FantasyTeam, Contest, selected_players, Participation, matches_between
Relations not in 1NF	-



SECOND NORMAL FORM

- A table is said to be in 2NF if both the following conditions hold:
 - Table is in 1NF (First normal form)
 - No non-prime attribute should be dependent on the proper subset of any candidate key of table (**No Partial Dependency**).

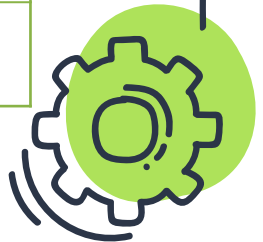
Relations in 2NF	User, Teams, Player, Matches, FantasyTeam, Contest, selected_players, Participation, matches_between,
Relations not in 2NF	-



THIRD NORMAL FORM

- ❑ A table is in 3NF if it is in 2NF and for each functional dependency $X \rightarrow Y$, at least one of the following conditions hold:
 - X is a super key of table
 - Y is a prime attribute of table.
- ❑ Or in other words, it shouldn't have Transitive Dependency.

Relations in 3NF	User, Teams, Player, Matches, FantasyTeam, Selected_players, Participation, matches_between
Relations not in 3NF	Contest



CONVERSION INTO 3RD NF

Contests
<u>contest_id</u> ContestName EntryFee Size Prizepool

2NF BUT NOT IN 3NF

Contests
<u>Contest_id</u> ContestName EntryFee Size

Contests Prize
<u>EntryFee</u> <u>Size</u> Prizepool

3NF



BOYCE-CODD NORMAL FORM

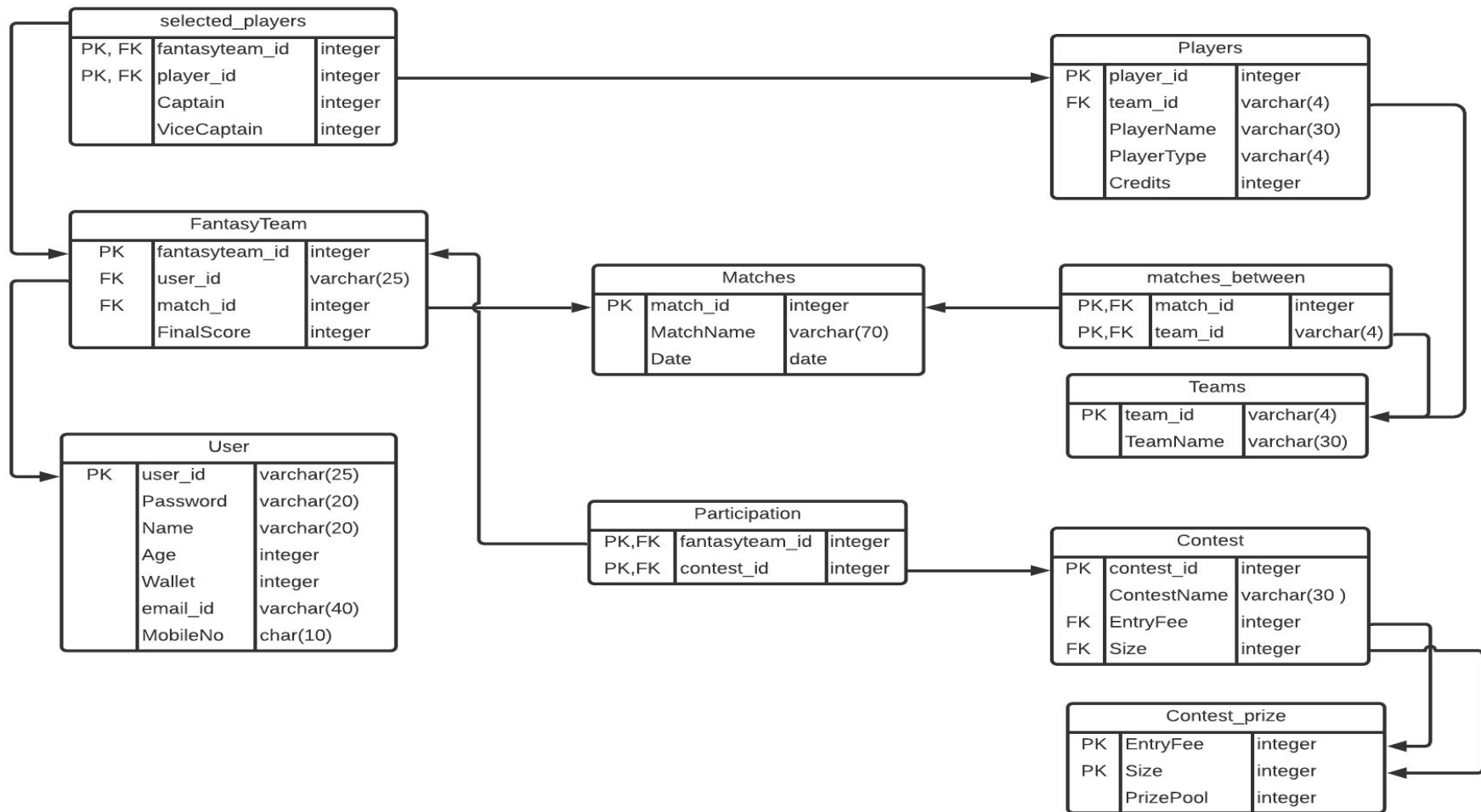
- ❑ For a table to satisfy the Boyce-Codd Normal Form, it should satisfy the following two conditions:
 - It should be in the Third Normal Form.
 - And, for any dependency $A \rightarrow B$, A should be a super key.

Relations in BCNF	User, Teams, Player, Matches, FantasyTeam, Contests, Participation, matches_between, selected_players, Contest_prize
Relations not in BCNF	-



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RELATION SCHEMA
AFTER NORMALISATION



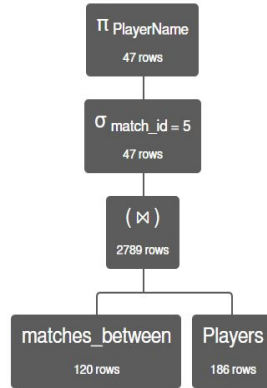
6

IMPLEMENTATION

RELATIONAL ALGEBRA EXPRESSIONS

Q. List all the players available for selection in the fantasy-teams by users in 5th IPL match.

$\pi \text{ PlayerName } (\sigma_{\text{match_id} = 5} (\text{matches_between} \bowtie \text{Players}))$



$\pi \text{ PlayerName } (\sigma_{\text{match_id} = 5} (\text{matches_between} \bowtie \text{Players}))$

Players.PlayerName

'Ambati Rayudu (R)'

'Monu Kumar (R)'

'Murall Vijay (R)'

'Ruturaj Gaikwad (R)'

'MS Dhoni (R)'

'Jagadeesan Narayan (R)'

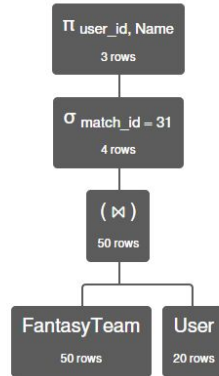
'K M Asif (R)'

'Dwayne Bravo (R)'

'Faf du Plessis (R)'

'Karn Sharma (R)'

Q. Find name of users who created fantasy team and participated in contests in match-31.

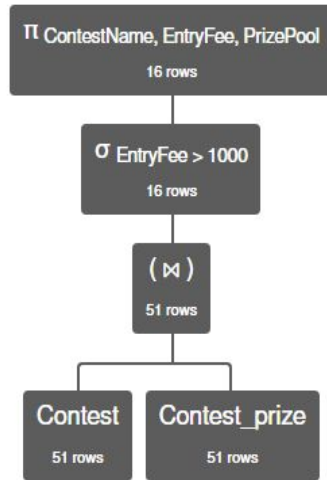


$\pi_{\text{user_id, Name}} (\sigma_{\text{match_id} = 31} (\text{FantasyTeam} \bowtie \text{User}))$

FantasyTeam.user_id	User.Name
'bommi_mahesh'	'Mahesh'
'ashish_chinthala'	'Ashish'
'gk_hire'	'Gowtham'

$\pi_{\text{user_id, Name}} (\sigma_{\text{match_id} = 31} (\text{FantasyTeam} \bowtie \text{User}))$

Q. Find the name and prize pool of the contest having an entry fee greater than 1000.



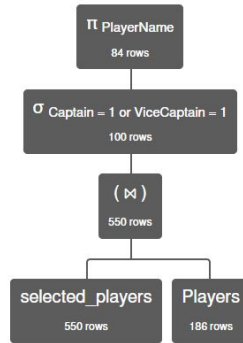
Π ContestName, EntryFee, PrizePool (σ EntryFee > 1000 (Contest \bowtie Contest_prize))

Π ContestName, EntryFee, PrizePool (σ EntryFee > 1000 (Contest \bowtie Contest_prize))

Contest.ContestName	Contest.EntryFee	Contest_prize.PrizePool
'Contests for Champions'	1234	15000
'Hot Contests'	1299	500000
'Head-to-Head'	1299	2250
'Contests for Champions'	1390	30000
'Contests for Champions'	1500	7500
'Head-to-Head'	1749	3000
'Contests for Champions'	1777	10000
'Contests for Champions'	1999	19000
'Contests for Champions'	1999	10000
'Contests for Champions'	2477	15000

Q. Find names of players who are at least once selected as either captain or vice captain by the users in total League.

$\Pi \text{ PlayerName } (\sigma_{\text{Captain} = 1 \text{ or } \text{ViceCaptain} = 1} (\text{selected_players} \bowtie \text{Players}))$



$\Pi \text{ PlayerName } (\sigma_{\text{Captain} = 1 \text{ or } \text{ViceCaptain} = 1} (\text{selected_players} \bowtie \text{Players}))$

Players.PlayerName

'Rahul Tripathi'

'Dale Steyn'

'Andrew Tye'

'Faf du Plessis (R)'

'Robin Uthappa'

'Ben Stokes (R)'

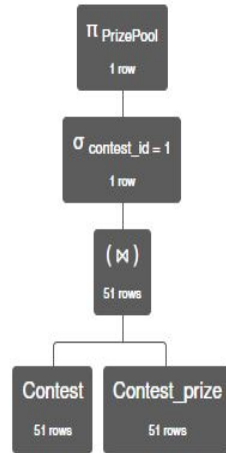
'Ambati Rayudu (R)'

'Ankit Rajpoot (R)'

'Prithvi Shaw (R)'

'Siddhesh Lad (R)'

Q. Find the prizepool of a contest for a given contest_id.



Contest_prize.PrizePool
0

$\pi_{\text{PrizePool}} (\sigma_{\text{contest_id} = 1} (\text{Contest} \bowtie \text{Contest_prize}))$



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IMPLEMENTATION
SQL QUERIES

Q. Find the name and id of user who got maximum "FinalScore" in the entire league.

The screenshot shows the MySQL Workbench interface. The SQL editor contains the following query:

```
1 • SELECT user_id,name
2 FROM project.User
3 where user_id in (select user_id
4                   from fantasyteam
5                   where finalscores = (select max(finalscore)
6                                       from fantasyteam));
```

The query is executed, and the results are displayed in the Result Grid:

user_id	name
pavan_kalyan	Pavan
NULL	NULL

The bottom panel shows the Action Output:

#	Time	Action	Message	Duration / Fetch
1	15:13:36	SELECT user_id,name FROM project.User where user_id in (select user_id from fantasyteam where finalscores = (select max(finalscore) from fantasyteam));	1 row(s) returned	0.000 sec / 0.000 sec

Q. List all the players available for selection in the fantasy team by users in 5th IPL match.

The screenshot shows the MySQL Workbench interface. The left sidebar displays the 'SCHEMAS' tree with the 'project' database selected. The main editor window contains the following SQL query:

```
5  
6  
7  
8 • select PlayerName  
9   from matches_between natural join players  
10  where match_id=5;  
11  
12
```

Below the query editor, the 'Result Grid' is visible, showing the following data:

PlayerName
Ambati Rayudu (R)
Monu Kumar (R)
Murali Vijay (R)
Ruturaj Gaikwad (R)
MS Dhoni (R)
Jagadeesan Narayan (R)
K M Asif (R)
Dwayne Bravo (R)

At the bottom, the 'Output' tab shows the execution details:

#	Time	Action	Message	Duration / Fetch
1	20:48:52	select PlayerName from matches_between natural join players where match_id=5 LIMIT 0, 1000	47 row(s) returned	0.000 sec / 0.000 sec

Q. Find name of users who created fantasy team and participated in contests in match-31.

The screenshot shows the MySQL Workbench interface. The left sidebar displays the 'SCHEMAS' tree with the 'project' database selected. The main editor window contains the following SQL query:

```
25 limit 5;  
26  
27  
28 • select name,user_id  
29 from fantasyteam natural join user  
30 where match_id = 31;  
31  
32
```

Below the query editor, the 'Result Grid' shows the following data:

name	user_id
Mahesh	bommi_mahesh
Ashish	ashish_chinthala
Mahesh	bommi_mahesh
Gowtham	gk_hire

At the bottom, the 'Output' tab shows the execution details:

#	Time	Action	Message	Duration / Fetch
1	20:50:18	select name,user_id from fantasyteam natural join user where match_id = 31 LIMIT 0, 1000	4 row(s) returned	0.000 sec / 0.016 sec

Q. Find all the users who created more than one fantasyteam for a single match

The screenshot shows the MySQL Workbench interface. The left sidebar displays the 'SCHEMAS' tree with the 'project' database selected. The main editor window contains the following SQL query:

```
13
14 • Select user_id,count(fantasyteam_id),match_id
15 from fantasyteam
16 group by match_id,user_id
17 having count(fantasyteam_id) >1;
18
19
20
```

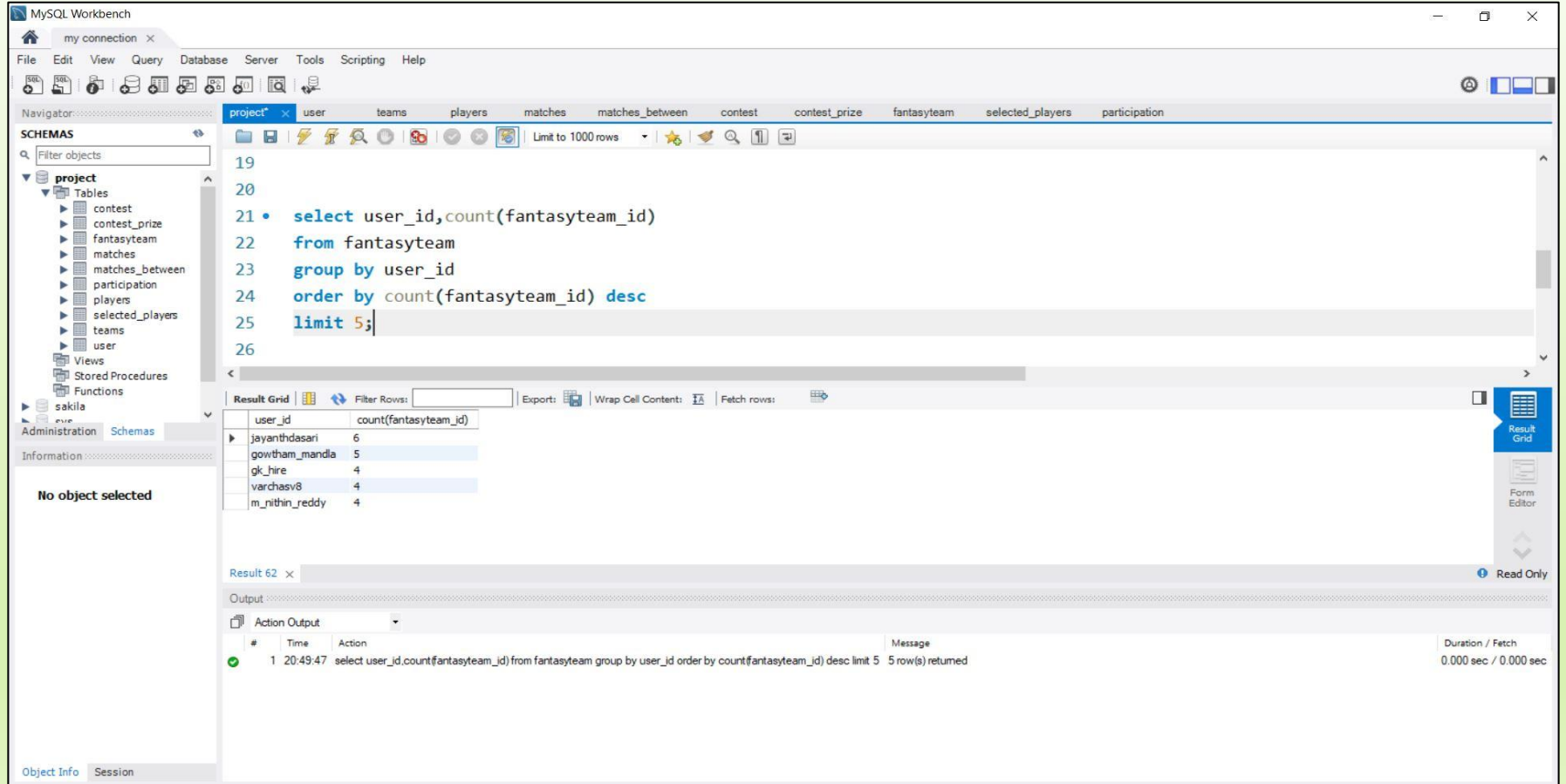
Below the query editor, the 'Result Grid' shows the results of the query:

user_id	count(fantasyteam_id)	match_id
sasank2804	2	5
jayanthdasari	2	21
bommi_mahesh	2	31

At the bottom, the 'Output' pane shows the execution details:

#	Time	Action	Message	Duration / Fetch
1	20:49:18	Select user_id,count(fantasyteam_id),match_id from fantasyteam group by match_id,user_id having count(fantas...	3 row(s) returned	0.000 sec / 0.000 sec

Q. Find top5 users who played many contests with their fantasy teams ?



The screenshot shows the MySQL Workbench interface. The left sidebar displays the 'project' database schema with various tables. The main editor window contains a SQL query to find the top 5 users based on the number of fantasy teams they have played in. The query is as follows:

```
19
20
21 • select user_id, count(fantasyteam_id)
22   from fantasyteam
23  group by user_id
24  order by count(fantasyteam_id) desc
25  limit 5;
26
```

Below the query editor, the 'Result Grid' shows the output of the query:

user_id	count(fantasyteam_id)
jayanthdasari	6
gowtham_mandla	5
gk_hire	4
varchav8	4
m_nithin_reddy	4

The bottom of the interface shows the 'Output' tab with the 'Action Output' section, indicating that the query was executed successfully and returned 5 rows.

Object Info Session

A hand-drawn dark blue frame with rounded corners. It features a zigzag line at the top center, a double line at the bottom center, an 'x' on the left side, and an 'x' with an arrow on the right side. An arrow at the top left points downwards.

Thank You