Project 3 (100 points) Name Oliver Conover

For this project you will be using the **Bowling League Example Database** and **Recipe Example Database** from the book. The data diagram is on page 730 of your book or can be found in our course module called “Reference Material” under Data Diagrams from our Book.

**Table Relationships in words**

1. Put into words the relationships of the Teams table to the Bowlers table when they are linked by TeamID. (2 points)

Every bowler has a a team ID, But not every team ID has a bowler.

Notice there are two lines connecting the tables using different fields. Notice the line coming from BowlerID to CaptainID, there is an O for optional. Not all table relationships are mandatory. Each bowler can be captain of one team but each bowler doesn’t have to be a captain.

**Knowing your tables**

2. Let’s start by learning about the number of rows in each of our tables. In the table below, record how many rows are in each table. (6 points)

|  |  |
| --- | --- |
| Table | Rows in result set |
| Bowlers | 32 |
| Bowler\_Scores | 1344 |
| Match\_Games | 168 |
| Tourney\_Matches | 57 |
| Tournaments | 20 |
| Teams | 10 |

3. Looking at the numbers in your result sets from questions # 2. (4 pts)

a. If you wrote a query using all tables, what is the largest number of rows you could have in your results set?

1344

b. If you wrote a query using Tournaments and Tourney\_Matches table, what is the largest number of rows you could have in your results set?

57

c. If you wrote a query using Teams and Bowlers, what is the largest number of rows you could have in your results set?

32

d. If you wrote a query using Tourney\_Matches and Match\_Games, what is the largest number of rows you could have in your results set?

168

e. If you wrote a query using Tourney\_Matches, Match\_Games and Bowler\_Scores, what is the largest number of rows you could have in your results set?

1344

**Simple queries using one or two tables (1 point each)**

1. Write a query to show where are we holding our Tournaments? Eliminate duplicates. Paste query here.

select distinct Tournaments.TourneyID, Tournaments.TourneyLocation

from Tournaments

1. Write a query to list all Tournament dates and locations. The dates should be sorted with the most recent date listed first. Paste query here.

select Tournaments.TourneyDate, Tournaments.TourneyLocation

from Tournaments

order by Tournaments.TourneyDate desc

1. Write a query to show all bowlers whose last name starts with H. Paste query here.

select b.BowlerLastName, b.BowlerFirstName

from Bowlers b

where b.BowlerLastName like 'H%'

1. Write a query to show what unique states our bowlers living in. Paste query here.

select distinct b.BowlerState

from Bowlers b

1. Using the Bowler\_Scores table, what was the point spread between a bowler’s handicap and raw score for each match and game played for winning games? Fields in your result set should include Match number, game id, bowler id, then calculate handicap – raw score and use an alias to call it PointDifference. Since it’s for winning games be sure to include the where clause of WonGames = 1. Should have 695 rows in your result set. Paste Query here.

select bs.MatchID, bs.GameNumber, bs.BowlerID, bs.HandiCapScore - bs.RawScore 'PointDifference'

from Bowler\_Scores bs

where bs.WonGame = 1

1. Show me the tournament date and location for any tournament in 2013. Paste Query here.

select t.TourneyDate, t.TourneyLocation

from Tournaments t

where t.TourneyDate

between '2012-12-31' and '2014-01-01'

1. List the bowlers first and last name concatenated into one field called FullName, and their phone number. Only list bowlers whose phone number contain 8. Paste query here.

select b.BowlerFirstName + ' ' + b.BowlerLastName 'FullName', b.BowlerPhoneNumber

from Bowlers b

where b.BowlerPhoneNumber like '%8%'

1. List the team names and the bowlers’ first name that are on that team. Sort by Teamid so the first team showing should be the Marlins. Paste query here.

select b.TeamID, t.TeamName, b.BowlerFirstName

from Bowlers b

join Teams t

on t.TeamID = b.TeamID

order by t.TeamID

1. List the bowlers on Team 3, 4 and 5 whose last name begin with the letter H. Past Query here.

select b.TeamID, t.TeamName, b.BowlerFirstName

from Bowlers b

join Teams t

on t.TeamID = b.TeamID

where t.TeamID in (3, 4, 5) and b.BowlerLastName like 'H%'

order by t.TeamID

1. Using the Bowlers and Bowlers score, show all the bowlers first name and last name and their **highest** handicapscore. Paste query here.

select b.BowlerFirstName, b.BowlerLastName, max(bs.HandiCapScore) 'Max Hadicap Score'

from Bowlers b

join Bowler\_Scores bs

on bs.BowlerID = b.BowlerID

group by b.BowlerFirstName, b.BowlerLastName

1. Using the Bowlers and Bowlers score, show all the bowlers first name and last name and their **lowest** handicapscore. Paste query here.

select b.BowlerFirstName, b.BowlerLastName, min(bs.HandiCapScore) 'Min Hadicap Score'

from Bowlers b

join Bowler\_Scores bs

on bs.BowlerID = b.BowlerID

group by b.BowlerFirstName, b.BowlerLastName

1. Using the Bowlers and Bowlers score, show all bowlers first name and last name and their **average** handicapscore. Paste query here.

select b.BowlerFirstName, b.BowlerLastName, avg(bs.HandiCapScore) 'Average Hadicap Score'

from Bowlers b

join Bowler\_Scores bs

on bs.BowlerID = b.BowlerID

group by b.BowlerFirstName, b.BowlerLastName

1. Using the Bowlers and Bowlers score, show bowlers first name and last name and how many games has each bowler played. Paste query here.

select b.BowlerFirstName, b.BowlerLastName, count(bs.MatchID)

from Bowlers b

join Bowler\_Scores bs

on bs.BowlerID = b.BowlerID

group by b.BowlerFirstName, b.BowlerLastName

1. What is the largest handicap score held by any bowler? Paste query here.

select b.BowlerFirstName, b.BowlerLastName, max(bs.HandiCapScore)

from Bowlers b

join Bowler\_Scores bs

on bs.BowlerID = b.BowlerID

group by b.BowlerFirstName, b.BowlerLastName

1. What locations hosted tournaments on the earliest tournament date? This is like the first questions from chapter 11 assignment where you use a subquery. Paste query here.

select t.TourneyLocation

from Tournaments t

where t.TourneyDate in (select min(t.TourneyDate) from Tournaments t)

1. What is the latest tournament date? Paste query here.

select t.TourneyLocation

from Tournaments t

where t.TourneyDate in (select max(t.TourneyDate) from Tournaments t)

1. Using Tourney\_Matches what are the unique lanes. Paste query here.

select distinct tm.Lanes

from Tourney\_Matches tm

21. Working with only the Bowlers table. (8 pts)

a. Write a query to show what cities our bowlers live in? Paste your query here.

select distinct b.BowlerCity

from Bowlers b

b. Write a query to show how many bowlers have a first name that starts with K? Paste your query here.

select count(b.BowlerFirstName)

from Bowlers b

where b.BowlerFirstName like 'k%'

c. Write a query to show how many bowlers have a last name that ends in son? Listing their first and last name in your result set. Paste your query here.

select b.BowlerFirstName, b.BowlerLastName

from Bowlers b

where b.BowlerLastName like '%son'

d. Write a query to show how many bowlers provided a Middle Initial? So the field is not blank. Paste your query here.

select b.BowlerFirstName, b.BowlerLastName

from Bowlers b

where b.BowlerMiddleInit is not null

22. Looking at the Bowler\_Scores table. (3 pts)

a. How many unique bowlers are in the bowler\_scores table?

32

b. Paste your query here.

select distinct bs.BowlerID

from Bowler\_Scores bs

c. How does this number compare to your count for the Bowler table in step 2.

It’s the same

d. What does it mean?

It means every bowler had at least one score associated with them.

**Inner Joins**

23. Use the Bowler\_Scores and the Match\_Games tables. find what the values of the field “WonGames” stand for. (5 points)

a.From the Bowler\_Scores table only, write a query to see what unique data is in the WonGames field. What are the values?

0 and 1

b. Paste your query here.

select distinct bs.WonGame

from Bowler\_Scores bs

c. Using Bowler\_Scores and Match\_Games (notice two fields are used to join the tables), write a query to show **all the fields** for matchid 1 and GameNumber 1. Sort by handicap score descending. Should return 8 rows.

Notice two fields are used to join the tables. This is the first time we have joined using two fields, the format would be

SELECT …..

FROM FirstTable

JOIN SecondTable

ON FirstTable.first field = SecondTable.firstfield

AND FirstTable.second field = SecondTable.secondfield

WHERE ……..

d. Paste your query here.

select \*

from Bowler\_Scores bs

join Match\_Games mg

on mg.MatchID = bs.MatchID

and bs.GameNumber = mg.GameNumber

where bs.GameNumber = 1 and bs.MatchID = 1

order by bs.HandiCapScore desc

e. For the 4 bowlers with the highest Handicap scores, what is value of the WonGame field?

1

**Outer Joins**

24. Write a query to show the Team Names with their CaptainID and the Captain’s first and last name. (10 pts)

a. What two tables will you use to get the Team Name and the Captain’s Name?

Teams and Bowlers

The two fields that link these tables do not have the same field name.

b. Paste your query here. There should be 10 rows.

select b.BowlerFirstName, b.BowlerLastName

from Teams t

left join Bowlers b

on b.BowlerID = t.CaptainID

c. How many TeamID are there in the Teams table? Paste your query here.

select distinct t.TeamID

from Teams t

left join Bowlers b

on b.BowlerID = t.CaptainID

d. How many **unique** TeamID are there in the Bowlers table? Paste your query here.

select distinct b.TeamID

from Teams t

left join Bowlers b

on b.BowlerID = t.CaptainID

e. Write **an outer join** query that will **show all** the Team Name, BowlerID and Bowlerlast name even if they don’t have bowlers assigned to the team. Remember from question 24.c. and 24 d. the table with the larger number of rows, is the table you want to point at. Paste your query here.

select t.TeamName, b.BowlerFirstName, b.BowlerLastName

from Teams t

right join Bowlers b

on b.BowlerID = t.CaptainID

and t.TeamID = b.TeamID

Notice with this query, you want to join the captainid with the bowlerid and also link using the TeamID field.

25. We will compare the TourneyID in the Tournaments and the Tourney\_Matches tables. (10 pts)

a. How many unique tourneyid are in the Tourney\_Matches table?

57

b. Paste your query here.

select distinct tm.MatchID

from Tourney\_Matches tm

c. How many **unique** tourneyid are in the tournaments?

20

d. Paste your query here.

select distinct tm.TourneyID

from Tournaments tm

e. If you run a query to show what TourneyID do not have a match id assigned to it. How many rows should you get?

37

f. Use an outer join with these tables. Pointing to the table that has more rows. Only return the Tourneyid that do not have a matchid assigned. Paste your query here.

select t.TourneyID

from Tourney\_Matches tm

right join Tournaments t

on t.TourneyID = tm.TourneyID

where tm.MatchID is null

26. For **every table** in this query, I want you to use an **alias**. Use alias on table names not fieldnames. We are going to link the Teams, Bowlers, Bowler Scores for any Won games. (10 points)

a. First write a query using just the Bowler\_Scores table, to see how many have game winning scores. (Use where WonGame = 1) Now we know how many rows should be in our result set, if we link our tables properly.

695

b. Paste your query here.

select \*

from Bowler\_Scores bs

where bs.WonGame = 1

c. Start with the Teams table with the fields TeamID and TeamName.

b. Add Bowlers table and add to the Select statement the Bowlers Last Name.

c. Add Bowler\_Scores table and and add to the Select statement the matchid, gamenumber for any wongames (game winning scores).

d. Make sure your query has the same number of rows as step 26 a. If not, you may have linked the Teams and Bowlers tables incorrectly. Paste your query here.

select t.TeamID, t.TeamName, b.BowlerFirstName, b.BowlerLastName

from Teams t

right join Bowlers b

on b.TeamID = t.TeamID

right join Bowler\_Scores bs

on bs.BowlerID = b.BowlerID

where bs.WonGame = 1

27. For the HandicapScore use the Minimum, Maximum and Average functions with the Bowlers and Bowler\_Score table. (18 total pts)

a. For each bowler, list their bowler id and bowler last name, minimum, maximum and average score. You should have 32 rows in your result set. Assign alias to your fields so the column headings are not blank. Remember to use a group by statement. Paste your query here. (3 pts)

select b.BowlerID, b.BowlerLastName, min(bs.HandiCapScore)'MinHandiScore',

max(bs.HandiCapScore)'MaxHandiScore', avg(bs.HandiCapScore) 'AverageHandiScore'

from Bowlers b

left join Bowler\_Scores bs

on bs.BowlerID = b.BowlerID

group by b.BowlerID, b.BowlerLastName

b. Send your output from this query to an excel file, clean up the file and upload it with your answer sheet. Call the file your lastname and project3. (2 pts)

c. Sort your excel file by the Minimum score, what is the bowlerid and lastname of the bowler with the lowest score? (2 pt)

7, Viescas

d. Sort your excel file by the Maximum score, what is the bowlerid and lastname of the bowler with the highest score? (2 pt)

27, Thompson

e. Find the minimum handicap score as a subquery like page 436 and 437 and then one row of data to show the bowlerid and last name and minimum score, so your query should give the answer you provided in step 27 c. Paste your query here. (3 pts)

select b.BowlerID, b.BowlerLastName

from Bowlers b

left join Bowler\_Scores bs

on bs.BowlerID = b.BowlerID

where bs.HandiCapScore = (select min(bs.HandiCapScore)

from Bowler\_Scores bs)

f. Write a query to show the bowlerid and last name for the maximum score. Should be the same as your answer to 27 d. Paste your query here. (3 pts)

select b.BowlerID, b.BowlerLastName

from Bowlers b

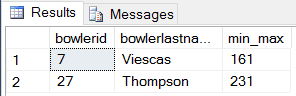
left join Bowler\_Scores bs

on bs.BowlerID = b.BowlerID

where bs.HandiCapScore = (select max(bs.HandiCapScore)

from Bowler\_Scores bs)

g. Combine your two queries (UNION) to produce the following result set. Notice the alias for the third column of data. Paste your query here. (3 pts)



select b.BowlerID, b.BowlerLastName, bs.HandiCapScore 'min\_max'

from Bowlers b

left join Bowler\_Scores bs

on bs.BowlerID = b.BowlerID

where bs.HandiCapScore = (select min(bs.HandiCapScore)

from Bowler\_Scores bs)

union

select b.BowlerID, b.BowlerLastName, bs.HandiCapScore

from Bowlers b

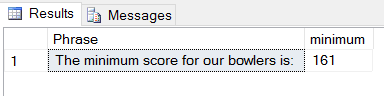
left join Bowler\_Scores bs

on bs.BowlerID = b.BowlerID

where bs.HandiCapScore = (select max(bs.HandiCapScore)

from Bowler\_Scores bs)

28. Create a result set that shows the following (notice the field alias). This uses a literal string like page 116 and 117: (2 points)



1. Paste your query here.

select cast('The minimum scor for our bowler is' as varchar) 'Phrase', bs.HandiCapScore 'Minumim Score'

from Bowlers b

left join Bowler\_Scores bs

on bs.BowlerID = b.BowlerID

where bs.HandiCapScore = (select min(bs.HandiCapScore)

from Bowler\_Scores bs)

29. Switch to using the **Recipe Example** database. Paste your query at the end of this question. . (5 points)

a. write a query using Recipe, RecipeIngredient and Ingredient.

b. Add the IngredientName has to be Onion. Show the RecipeTitle. There should be 5 rows in your result set.

c. Make this query your subquery. Now we want to show all the ingredient names that are on those 5 RecipesTitles.

d. Use the same tables in your first query but remove the Onion requirement. In the first query add a WHERE statement that links that RecipeTitle to the subquery RecipeTitle. Result set should have 36 rows.

Paste query here.

select r.RecipeTitle, i.IngredientName, i.IngredientID

from Recipes r

right join Recipe\_Ingredients ri

on r.RecipeID = ri.RecipeID

right join Ingredients i

on i.IngredientID = ri.IngredientID

where r.RecipeTitle = (

select r.RecipeTitle

from Recipes r

left join Recipe\_Ingredients ri

on r.RecipeID = ri.RecipeID

left join Ingredients i

on i.IngredientID = ri.IngredientID

where i.IngredientName = 'Onion'

)