HW 8

Student Name Sivaranjani Prabasankar Section

Instructor *Luke Papademas*

Due Date

Part	1	2	3	4	TOTAL	Score
Maximum Points	25 points	25 points	25 points	25 points	100 points	

Textbook Reading Assignment

Thoroughly read Week 1 - 15 course lecture notes.

Part 1 Data Management and Business Intelligence

[The Concession Stand Application]

Your database development division has been approached by your firm's client the Cinema Center Group (CCG), which wishes to develop a database application that tracks the sales activities of their theater concession stands. Currently, CCG operates four separate thirty - screen cinema complex locations, each of which has two main refreshments / concession stands.

The data table below shows a sample of concession stand sales that were taken from actual transactions, for some particular random dates. The transaction IDs , transaction amounts, cinema complex locations and transaction dates for these sample data items are shown.

[Database Table: Sales]

Transaction	Amount	Location	Date
T1	\$32.87	CCG03	4/11/2019
T2	\$5.31	CCG02	4/11/2019
T3	\$3.72	CCG03	4/11/2019
T4	\$8.95	CCG03	4/11/2019
T5	\$12.16	CCG01	4/11/2019
T6	\$28.20	CCG02	4/11/2019
T7	\$17.96	CCG03	4/11/2019
T8	\$22.91	CCG04	4/12/2019
T9	\$37.08	CCG01	4/12/2019
T10	\$40.91	CCG04	4/13/2019

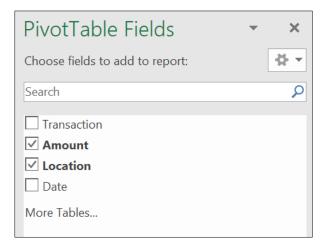
Use the above transactions to perform these various business intelligence related investigations.

(1) (MS Excel Pivot Table)

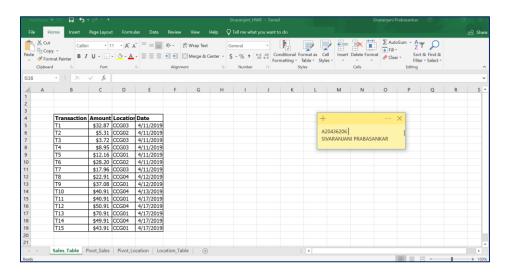
Copy the above **Sales** table into a new MS Excel worksheet and create a Pivot Table base on the records in this table. Use this MS Excel navigation path on the Ribbon: \lceil **Insert** \rceil tab \rightarrow \lceil **Tables** \rceil group \rightarrow \lceil **PivotTable** \rceil link

Perform the pivot on these fields, listed below.

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Paste a snapshot of your resulting pivot report below. Save your current MS Excel workbook.



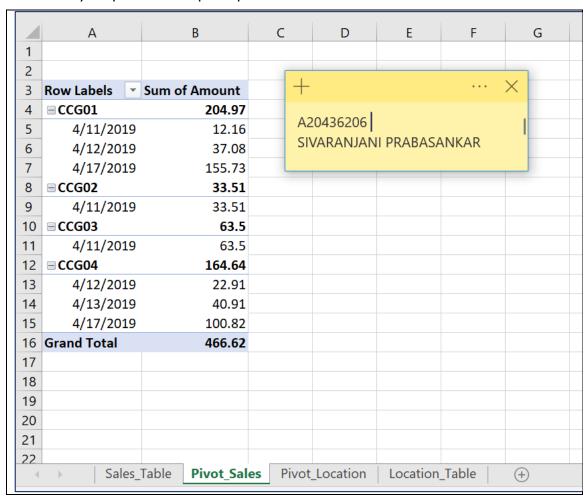
Also, describe below the business intelligence information that can be ascertained from your resulting pivot table.

4	А	В	С	D	E	F	G
1							
2							
3	Row Labels 🔻	Sum of Amount	-	+		• • • •	X
4	⊕ CCG01	204.97		40040600	-1		
5	⊞ CCG02	33.51		A20436206			
6	⊞ CCG03	63.5		SIVARANJA	ANI PRABA	SANKAR	
7	⊞ CCG04	164.64					
8	Grand Total	466.62					
9							
10							
11							
12							

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(2) (MS Excel Pivot Table)

Add another <u>five</u> similar transactions to your Excel worksheet that contains the **Sales** table. You will thus then have fifteen total records. Use the current date for your new transactions. Save and close your MS Excel workbook. Re - open the workbook again and select to include the "Date" field for your pivot report. Then, take a snapshot of your updated pivot table. Paste the snapshot below. Was your pivot table report updated with the new data table records?



(3) (MS Excel Pivot Table)

Into a new worksheet in your Excel workbook, repeat the above steps and create a Pivot Table based on the data from the table given below. This **Locations** table displays a key field, a location name, a region that contains the location and a location sales density level.

Choose appropriate fields to design your report but be sure to include the "SalesDensity " field. Take a snapshot of your pivot table. Paste the snapshot below.

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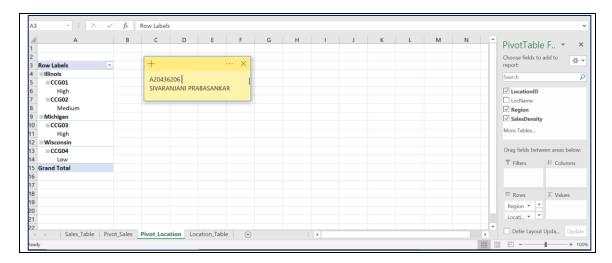
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Then, describe the business intelligence information that can be determined by your **Locations** pivot table report.

[Database Table: Locations]

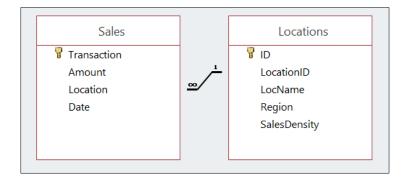
LocationID	LocName	Region	SalesDensity
CCG01	CCG 30	Illinois	High
CCG02	Norwood	Illinois	Medium
CCG03	Battle Creek 30	Michigan	High
CCG04	Janesville Cinema	Wisconsin	Low



(4) (MS Access Entity Relationships)

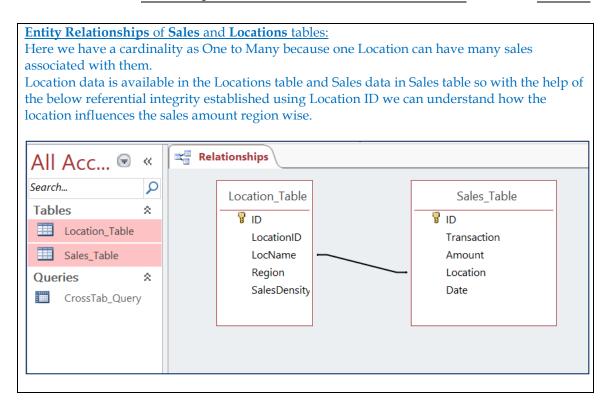
Load both your **Sales** and **Locations** worksheets into a new MS Access database file. Then, create a relationship between the two data entities. To create the relationship, use this MS Access navigation path on the Ribbon:

[Database Tools] tab \rightarrow [Relationships] group \rightarrow [Relationships] link



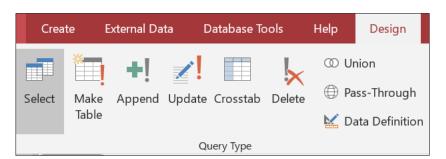
Paste a snapshot of the entity relationship diagram that is provided and comment on the cardinality and the referential integrity described or understood by the diagram.

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(5) (MS Access CrossTab Query)

Now create a CrossTab query in MS Access. Your Access CrossTab query is to include both your **Sales** table and your **Locations** table.



Use these fields / settings for your CrossTab query and execute the query.

Field:	Amount	LocName	Region
Table:	Sales	Locations	Locations
Total:	Sum	Group By	Group By
Crosstab:	Value	Row Heading	Column Heading
Sort:			
Criteria:			
or:			

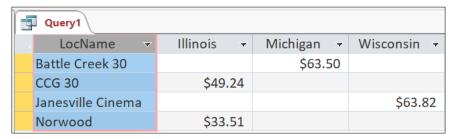
Observe the results of your query.

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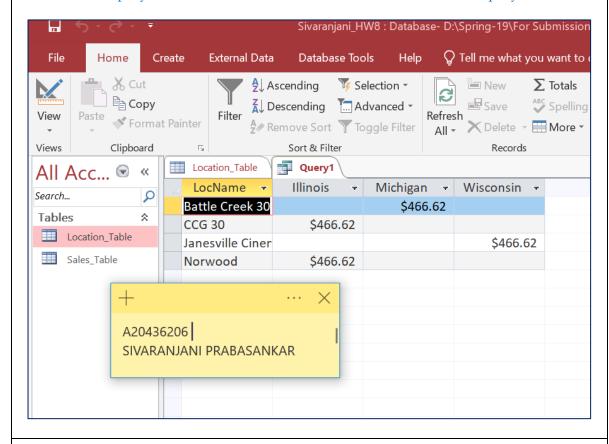
Your summarized values of course will differ from this sample screen snapshot.



Paste a snapshot of your CrossTab query results and comment on the effectiveness of this query for data science / business intelligence purposes. In your discussion, include also some issues that perhaps are not explained or not presented in your query results.

Here we have the output for the Cross-Tab Query that displays the total sales amount from the Sales table and the categories of regions. We can see how much is made in each of the below regions. As far as business intelligence is concerned, this information is highly critical for making critical calculated business decisions.

In a real-life company, scenario such results can decide make or break for a company.



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Part 2 Distributive Database Management Systems

(1) (Database Management Systems)

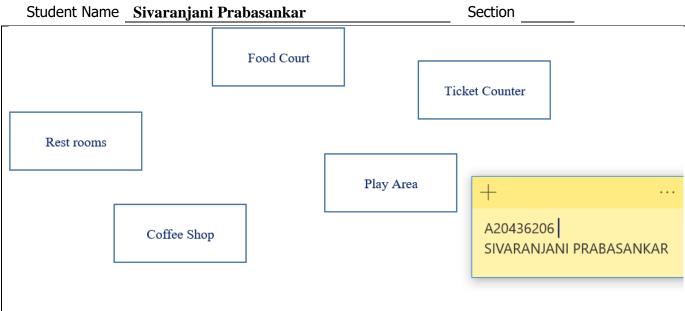
Prior to choosing a database management system (centralized or distributed) for their concession stand operations, the cinema group wishes to discuss with your project management team and your data team the manner in which data is collected. You will prepare a block diagram of a typical movie theater concession stand. This diagram will assist both your company's data team and the cinema group's IT staff in having a mutual understanding of how the data is physically collected by the sales, products and suppliers processes.

A partially - completed sample concession stand block diagram of the placement of the components of the stand is provided below. Use your own imagination and experience as to what is the design of a typical movie theater concession stand.

	cash registers and candy bars	J	
		-	coffee bar
for the state of			
food court]	
	beverage island		

Use MS Visio (Office Layout template) to design your complete infographic and paste the diagram here.

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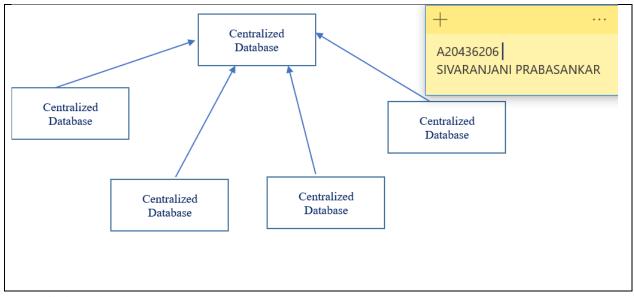


(2) (Centralized Database Systems)

Some information technology staff members of the cinema group firm have suggested that they should use a centralized database system for their sales data. They desire that your own IT team design an infographic of the imagined centralized system. To support their choice of a type of database management system, the IT staff of the cinema group will present your infographic during the next CCG database activities meeting.

Using the MS Visio graphics drawing tool, draw an infographic that describes your version of the centralized database system that you believe the client should implement.

Paste a copy of your Visio infographic in the space provided.



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(3) (Centralized Database Systems)

Suppose that the client does decide to proceed with the construction of a centralized database system for their sales transactions. Explain how the centralized database system will be advantageous for their particular enterprise.

- 1. The data integrity is maximized as the whole database is stored at a single physical location. This means that it is easier to coordinate the data and it is as accurate and consistent as possible.
- 2. The data redundancy is minimal in the centralized database. All the data is stored together and not scattered across different locations. So, it is easier to make sure there is no redundant data available.
- 3. Since all the data is in one place, there can be stronger security measures around it. So, the centralized database is much more secure.
- 4. Data is easily portable because it is stored at the same place.
- 5. The centralized database is cheaper than other types of databases as it requires less power and maintenance.
- 6. All the information in the centralized database can be easily accessed from the same location and at the same time.

(4) (Distributed Database Systems)

Suppose that the client does decide to proceed with the construction of a distributed database system for their sales transactions. Explain how you would utilize, in this system, both remote requests / transactions as well as distributed requests / transactions.

In a distributed database system, a transaction is we basically have remote transactions, remote requests and distributed transactions and requests

Distributed Requests and Distributed Transactions

- A remote request allows us to access data to be processed by a single remote database processor.
- A remote transaction, composed of several requests, may access data at only a single site.
- A distributed transaction allows a transaction to reference several different (local or remote) Data Processor sites
- A distributed request lets us reference data from several remote DP sites. It also allows a single request to reference a physically partitioned table.
- In case of a distributed database system we manage all these transactions by following a Two-Phase Commit protocol which basically ensures that not partial changes are done in a transaction. If the transaction is unable to commit, then this protocol ensures that the changes that were done earlier and undone. A transaction only gets completed when it is committed by all the sites participating in the transaction. So, this how we will basically manage all the transaction and the requests in the distributed database systems.

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(5) (Distributive Database Management Systems)

If the client decides on a distributive system, comment on how you would manage such as database system. Be sure to apply textbook principles and practices in your response.

A distributed database management system is a system where the data is not stored at a single place, but the data is distributed over several systems on a lot of sites. Management of a distributed system is very important as the user need to see this distributed system as a single system.

In a distributed database system, it is very important that every database must have a unique global database name.

- The management and creation and administration of a distributed system with all unique database names is very important.
- In this system we also need to manage the access of the database link session as until the session is not closed the link remains open only.
- We need to manage the system in such a way that the user links remain close after the session is over.
- The customer needs to manage simultaneousness of segments which implies the covering of different capacities like nourishment court, bistro and refreshments putting in their requests in the meantime should be taken care of effectively, appropriate line system must be consolidated giving needs to the solicitations which should be finished immediately.
- The customer has to likewise manage autonomous disappointment of systems, the customer ought to supplant or should have exchange systems prepared in the event of disappointments.
- The customer should be prepared to deal with any area straightforwardness issues and appropriate correspondence between the systems should happen so no reactions are returned.
- The application must perceive information area, and they should have the capacity to stick together information from different locales. There might emerge some innovative troubles like information respectability issues, exchange the board, reinforcement and recuperation. The customer must deal with these issues successfully.

Part 3 Data Analysis Concepts / Data Mining Concepts

(1) (Data Analytics)

The movie theater firm Cinema Complex Group (CCG) wishes to perform data analytics on the sales of their concession stand.

Today's sales of one concession stand are listed and summarized in categories as follows:

Concession Stand A2 Total Revenue for Monday

Popcorn	Candy	Soda Drinks	Pizza	Nachos	Other
\$ 573	\$ 922	\$ 1,280	\$ 391	\$ 189	\$ 93

Using Oracle, MS Access, MS SQL Server, IBM DB2 or MySQL construct SQL statements that can be used with the above data categories and values to generate the following statistics:

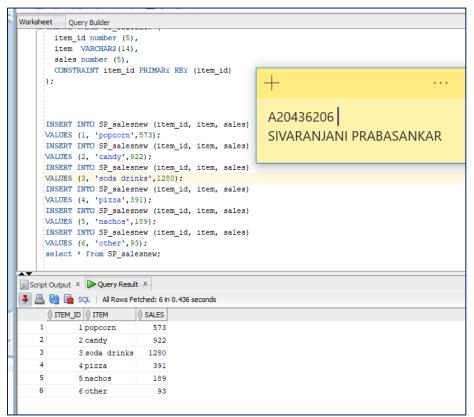
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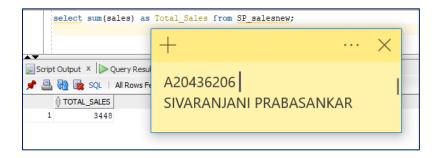
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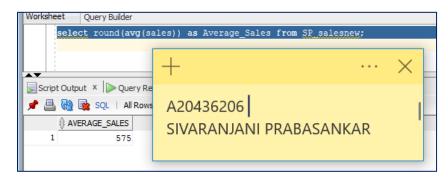
Table Creation



Total revenue of the above six food and drink categories

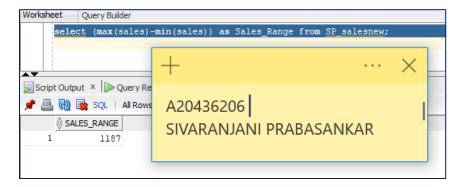


The average sales of the above six food and drink categories

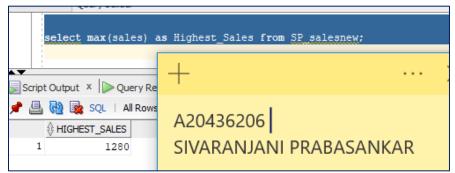


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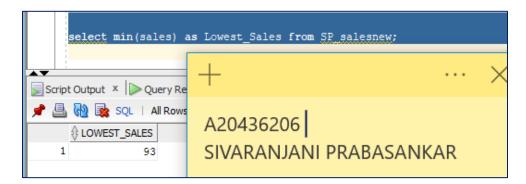
The range of sales of the above six food and drink categories

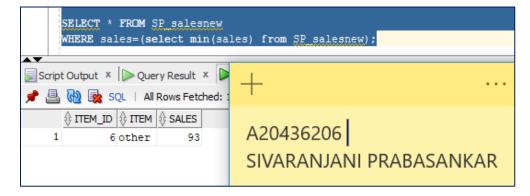


The category that exhibited the highest number of sales



The category that exhibited the least number of sales





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(2) (Multi - Dimensional Data Analytics: ROLLUP)

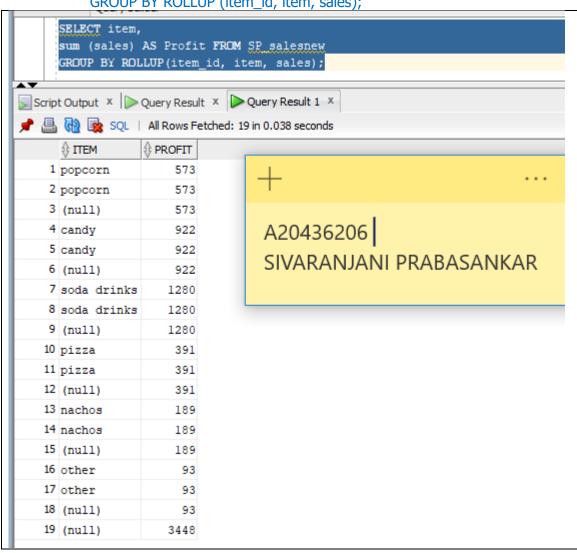
The SQL ROLLUP statement creates subtotals gathered from data at the most detailed level into a grand total.

An example of this aggregation statement is given below:

```
SELECT Department, Region, Time, sum(Profit) AS Profit FROM tblSales GROUP BY ROLLUP(Dept, Region, Time);
```

Using the form and structure of the above example, create a similar SQL ROLLUP function that is suitable for your concession stand application and then describe what results will be expected when the statement is executed.

SELECT item, sum (sales) AS Profit FROM SP_salesnew GROUP BY ROLLUP (item id, item, sales);



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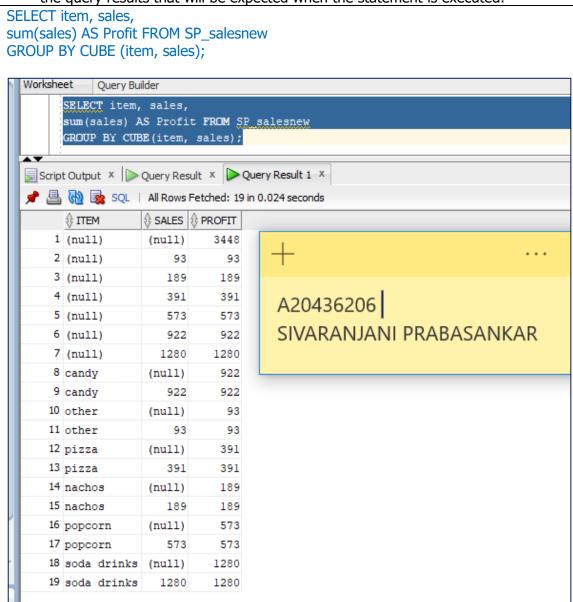
(3) (Multi - Dimensional Data Analytics: CUBE)

The SQL CUBE statement generates all the subtotals that could be calculated for a data cube having the specified dimensions.

An example of this aggregation statement is given below:

```
SELECT Department, Region, Time, sum(Profit) AS Profit FROM tblSales GROUP BY CUBE(Dept, Region, Time);
```

Using the form and structure of the above example, create a similar SQL CUBE function that is suitable for your concession stand application and then describe the query results that will be expected when the statement is executed.



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(4) (Multi - Dimensional Data Analytics: DICE)

Multi - Dimensional Analysis uses slice - and - dice techniques to view multi - dimensional information from different perspectives.

A DICE in Multi - Dimensional Analysis means cutting the data cube vertically. An example would be examining data for a particular date within a column of dates.

Provide a similar example of a DICE operation on a multi - dimensional data cube. Your example is to relate to our concession stand database operation.

DICE

item	location	rating
laptop	Illinois	8
lamp	Phoenix	7
popcorn	California	10

After dice - Selecting only rating

product	location
laptop	Illinois
lamp	Phoenix
popcorn	California

(5) (Multi - Dimensional Data Analytics: SLICE)

Slicing in Multi - Dimensional Analysis means cutting the data cube horizontally. An example would be examining data that was available for viewing year by year can be viewed as month by month.

Provide a similar example of a SLICE operation on a multi - dimensional data cube. Your example is to relate to our concession stand database operation.

SLICE

item	location	rating
laptop	Illinois	8
lamp	Phoenix	7
popcorn	California	10

After Slice - Selecting one row books

product	location	rating
laptop	Illinois	8

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Part 4 Database Connectivity and Web Technologies

(1) (Database Connectivity)

Your back - end team is investigating some options for database connectivity for the cinema complex application. Provide some examples of database connectivity options and what they are used for.

Following are the examples of database connectivity options that can be used for this application:

Open database Connectivity (ODBC) is most broadly bolstered database interface, ODBC enables any windows application to get to social information sources utilizing SQL by means of a standard API.

Native SQL connectivity: This sort of connectivity is merchant given; the precedent can be given of RDBMS frameworks. Native database connectivity interfaces are advanced for an explicit DBMS, anyway keeping up numerous databases can turn into a weight for software engineer subsequently, there ought to be a general database connectivity.

Information Access Objects (DAO) is a question arranged API used to get to work area databases, for example, MS Access and FileMaker Pro.

Remote Data Objects (RDO) is a more elevated amount question arranged application interface used to get to remote database servers. RDO utilizes the lower level DAO and ODBC for direct access to databases.

OLE-DB: Object connecting and Embedding for Database it includes protest arranged usefulness for access to social and non-social information. OLE-DB depends on COM, the items contain information and techniques, otherwise called interface. Maybe a couple of the classes and interface utilized by OLE-DB are Session, direction and Row Set.

ADO.NET: Microsoft's ActiveX information objects is a part-based stage for fusing appropriated, heterogeneous, interoperable applications used to control information utilizing mixes of system, working framework and programming dialect. ADO.NET presents two new segments Data sets and XML bolster ADO.NET has different articles like association, direction, Data Reader, Data Adaptor, Dataset, and information table.

Security Database: This is used for storing the set points and the user info when the system security is important.

(2) (Database Connectivity)

Your back - end team is also investigating implementing an ODBC model. Describe the steps are that required to create an ODBC data source name.

Open Database Connectivity (ODBC) is a standard API for getting to Database Management System to archives from different fundamental databases using ODBC clarifications in our program.

ODBC has mostly three segments

- ⇒ ODBC API through which programs get to ODBC
- ⇒ ODBC driver forms, this solicitations SQL inquiries and gives results
- ⇒ ODBC Driver Manager, which deals with all the DB associations and burdens it

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Steps to make an ODBC

- ⇒ Oracle customer programming must be introduced and open the ODBC Data Source Administer
- ⇒ Run the undertaking report server and afterward open the ODBC sources applet
- ⇒ Got System DSN and snap include, then make another information source
- ⇒ Pick the correct driver and hit wrap up
- ⇒ Select the reasonable settings for the database at that point test the chose association
 - To the create new data source window and select the MySQL ODBC 3.51 Driver for that we will first have to download the MySQL ODBC 3051 Driver
 - Fill in the connection information about how to connect a database in MySQL
- ⇒ After the last design of information source, the chose name will be obvious in the rundown of information sources

(3) (Database Connectivity)

Should the back - end data team also consider the OLE - DB connection model, explain the OLE - DB model based on its two types of objects.

- OLE-DB is composed of a series of COM objects that provide low-level database connectivity for applications. Because OLE-DB is based on the COM object model, the objects contain data and methods (also known as the interface.) The OLE-DB model is better understood when you divide its functionality in two types of objects:
- Consumers are all those objects (applications or processes) that request and use data. The data consumers request data by invoking the methods exposed by the data provider objects (public interface) and passing the required parameters.
- Providers are the objects that manage the connection with a data source and provide data to the consumers. Providers are divided in two categories: data providers and service providers.
- Data providers provide data to other processes. Database vendors create data provider objects that expose the functionality of the underlining data source (relational, objectoriented, text, and so on.)
- Service providers provide additional functionality to consumers. The service provider is located between the data provider and the consumer:

(4) (Mobile Smart Devices)

Modern enterprises now require mobile applications that can be viewed on smart telephones. Visit the link below to examine the mobile application development platform for Visual Studio .NET .

https://docs.microsoft.com/en-us/visualstudio/crossplatform/visual-studio-and-xamarin

Then, expound upon using such technologies for a mobile application that Cinema Center Group (CCG) could use for their management to remotely monitor sales activities for their many concession stand operations.

Cinema focus Group (CCG) can utilize Xamarin and visual Studio to develop a mobile application to monitor the sales activities remotely for their concessions and operations as it will help them increase their profitability.

Also, mobile application is handier and easier to use by customers and it will help CCG to keep a track on the sales anytime and anywhere.

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CCG can use Visual Studio .NET to make mobile application for both android as well as ios users. Also, it will give them a chance to reach their audience directly. The customers using this mobile app can also provide their valuable feedback to the company which will help the company to improve their services. It will help in time saving and managing and tracking the sales better.

- ⇒ Moreover, Xamarin is a portable application improvement instrument to build up a Native Android, iOS and Windows stage application from a typical C#/.NET stage.
- ⇒ Applications created in Xamarin have a high re-ease of use between stages. They consolidate to stage explicit bundles with little impact on runtime execution.
- ⇒ Xamarin has indistinguishable highlights from C#, .NET, and visual studio so a man comfortable with these stages can without much of a stretch build up a CCG application.
- ⇒ It gives remote investigating on Android, iOS and Windows telephones without taking in the base programming dialect of the gadget. The means CCG designers can use to build up a portable application with Xamarin incorporate, first setup the Xamarin procedure, after the establishment of Xamarin programming introduce the bundles required for the application, check the Xamarin condition.
- ⇒ Xamarin with visual studio has deft apparatuses which make the advancement of use simple. Before beginning with the advancement of the versatile application related libraries must be introduced like .NET and so forth.

(5) (Cloud Computing Services)

Your firm currently does not support cloud services. Visit the link below to examine a typical cloud service provider and the details of their services and features. Then, comment on the feasibility, functionality and practicality of placing the Cinema Center Group (CCG) data into the cloud with the above service.

http://www.brinkster.com/cloud/cloud-servers/overview.aspx

CCG can put the data into cloud with the above organization and the reasons are as follows

1. SOLIDFIRE'S 100% SOLID STATE STORAGE

A cloud infrastructure of any size demands a more coordinated approach across both host and storage resources.

2. LOWER ONGOING COST

Wide variety of Cloud Server flavors allow you to optimize for ongoing budget, your application's necessary workloads, all while bringing down on-going in-house IT costs.

3. SCALE UP & DOWN - USE EXACTLY WHAT YOU NEED

With Cloud Servers no need to worry about dealing with "limited capacity" - which can diminish a customer's experience, or the setting up of expensive idle hardware.

4. FOCUS ON BUSINESS NOT INFRASTRUCTURE

Cloud Servers lets you shift your focus (and valuable IT resources) from the data center back to the business of "running of your business."

5. CLOUD SERVER PRICING & FLAVORS

Scale up and down. With Cloud Servers you only pay for what you need.

6. NO UPFRONT CAPITAL COST

Traditional on-premise infrastructure is expensive, slow, needs installation and configuration, and requires a large upfront capital expense. With Cloud Servers that painful upfront capital expense is replaced with a low monthly fee - one where you pay for only what you need.

7. QUICKER DEPLOYMENTS. FASTER TIME TO MARKET

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Every business has a window of opportunity in which to capitalize. With traditional infrastructure it can take weeks to get a single server "deployment-ready" - costing your business valuable revenue as your competitors reach the market before you do. Cloud Servers allow you to get your new product to market as soon as it's ready. Deploy what you need, when you need it.