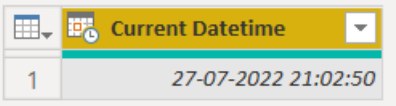
BDAT 1010
Business Intelligence

Individual assignment -Transformation, M coding and DAX (20 Marks)

Part 1: Power BI Transformation and M-Code

1. Capture the current datetime in Power Query using Power BI M-Code.



2. Create ID1, ID2, and ID3 columns against Full Name as shown in the table below and populate the required value in Power Query using M-Code.
    a. ID1: Value starts from 0 and increments by 1.
    b. ID2: Value starts from 1 and increments by 1.
    c. ID3: Value starts from 0 and increments by 5.

    Note: Create a column using "Enter Data" option and populate the values mentioned in the table. Once the "Full Name" column is created add the other columns (ID1, ID2, and ID3) based on the above condition.

ID1	ID2	ID3	Full Name
0	1	0	***YOUR, NAME, HERE***
1	2	5	Micaela, Elizabeth, Abbott
2	3	10	Breonia, Bryce, Abbott
3	4	15	Miranda, Daniela, Abella
4	5	20	Madelyn, Jacob, Abraham
5	6	25	Lyla, Nicholas, Acevedo

6	7	30	Kylia, Zoe, Acevedo
7	8	35	Jase, Marie, Adam
8	9	40	Jessica, June, Adam
9	10	45	Xaivore, Ann, Adams

3. Extract First Name, Middle Name, and Last Name from the "Full Name" column as mentioned below using Power Query. [Use Enter data to create the below table with a "Full Name" column].
   Note: Full Name is a combination of "First Name, Middle Name, Last Name".

Full Name
YOUR NAME HERE
Micaela, Elizabeth, Abbott
Breonia, Bryce, Abbott
Miranda, Daniela, Abella
Madelyn, Jacob, Abraham
Lyla, Nicholas, Acevedo
Kylia, Zoe, Acevedo
Jase, Marie, Adam
Jessica, June, Adam
Xaivore, Ann, Adams

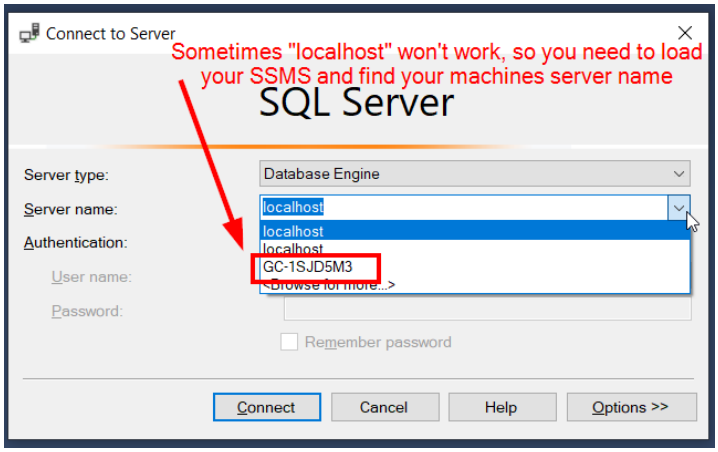
4. Extract Date from DateKey column present in the table below using Power Query.

DateKey(yyyyMMdd)
20220101
20220102
20220103
20220104
20220105
20220106
20220107
20220608
20220109
20220110

   Note: Use "Enter Data" option to create the above table in Power BI.

5. Create two parameters to input the Server and Database name and import the **'Product'** table using Power Query.
   Use the following configuration for the parameters-
   - Parameter1: **Servername_StudentNum#########_fName_lName**
     Local server as Localhost & 127.0.0.1

BDAT 1010
Business Intelligence



- Parameter2: Database
  Database as "AdventureWorks2014" & "AdventureWorks2012"

Once the parameter is created, import the mentioned table using MS SQL Server connector.

Note: Before performing the above exercise make sure you have restored the mentioned database.

Refer to the below URL to download the database backup file, after downloading the .bak file restore to the local SQL Server database.

- ✓ AdventureWorks2014: https://github.com/Microsoft/sql-server-samples/releases/download/adventureworks/AdventureWorks2014.bak
- ✓ AdventureWorks2012: https://github.com/Microsoft/sql-server-samples/releases/download/adventureworks/AdventureWorks2012.bak

6. Convert the below table to matrix structure (Expected output) using Power Query.

Input Dataset:

Year	Month	Sales
2021	Jan	520
2021	Feb	360
2021	Mar	210
2021	Apr	320
2020	May	160
2020	Jun	963
2020	Jul	201
2020	Jan	302
2020	Feb	500
2020	Mar	450

Expected Output:

Year	Jan	Feb	Mar	Apr	May	Jun	Jul
2020	302	500	450	null	160	963	201
2021	520	360	210	320	null	null	null

Note: Use "Enter Data" option to create the above table in Power BI.

7. Combine all the records from "StudentFromLocationA" table with "StudentFromLocationB" table using Power Query. You can use Append Query to combine these two tables.

Note: Use "Enter Data" option to create the below tables in Power BI.

StudentFromLocationA:

BDAT 1010
Business Intelligence

ID	First Name	Last Name	DOB	Department
1	***YOUR FIRST NAME***	***YOUR LAST NAME***	20-06-2000	IT
2	Micaela	Abbott	15-08-1995	MCA
3	Breonia	Abbott	18-02-1998	ME
4	Miranda	Abella	20-03-1999	ECE
5	Madelyn	Abraham	30-12-2000	CSE

StudentFromLocationB:

ID	First Name	Last Name	DOB	Department
8	Jackson	Adcock	15-02-2000	ME
9	Kara	Adeeb	21-08-1995	CSE
10	Brittany	Adkins	18-02-1996	MCA
11	Julia	Agan	23-05-1994	IT
12	Anyssa	Aguilar	15-09-2000	ECE

8. Merge all the records from the "Student" table with "Department" using Power Query. You can use Merge Query to combine these two tables. Here DepartmentID is a key column in both the tables.
   Note: Use "Enter Data" option to create the below tables in Power BI.

Student

ID	First Name	Last Name	DOB	DepartmentID
1	***YOUR FIRST NAME***	***YOUR LAST NAME***	20-06-2000	1
2	Brittany	Adcock	15-08-1995	2
3	Brian	Adeeb	18-02-1998	3
4	Julia	Adkins	20-03-1999	1
5	Tea	Agan	30-12-2000	2

Department

DepartmentID	Department Code	Department Name
1	IT	Information Technology + ***"YOUR STUDENT NUMBER ########"***
2	ME	Mechenical Engineering
3	CSE	Computer Science Engineering

9. Download "2020-monthly-visitor-statistics.xlsx" file from the link given below. After downloading the file, load the "Days by Island" sheet in Power BI Desktop and apply Power Query transformation to extract a part of the data (highlighted in the dataset snapshot).

   Note: Download "2020-monthly-visitor-statistics.xlsx" file from the below URL:
   https://www.hawaiitourismauthority.org/media/7901/2020-monthly-visitor-statistics.xlsx

Input Dataset: -

BDAT 1010

Business Intelligence

2020 Visitor Days by Island and Month (Arrivals by Air)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
O'ahu	36,47,908	31,06,258	17,19,457	92,974	1,91,462	3,11,721	3,56,088	4,55,805	3,18,122	5,22,327	8,63,638	12,43,871	1,28,29,630
Maui	21,97,687	19,62,660	10,57,111	13,195	31,900	54,141	62,432	66,381	87,807	3,13,046	7,12,026	9,94,709	75,53,095
Moloka'i	35,919	28,029	14,135	212	1,922	2,796	3,688	1,434	2,592	7,359	8,247	11,615	1,17,947
Lāna'i	25,108	23,405	9,158	34	178	1,073	1,365	1,033	711	6,084	6,622	8,457	83,228
Kaua'i	9,20,439	8,37,629	4,42,047	5,960	17,333	30,915	39,219	46,169	44,253	1,59,765	3,22,018	74,607	29,40,354
Hawai'i Island	14,45,673	11,63,151	6,66,084	19,249	40,412	72,483	1,04,803	1,30,566	1,60,688	2,13,822	3,73,547	6,02,066	49,92,542

Notes: monthly data may not add up to total due to rounding

2020 Visitor Arrivals by Island and Month (Arrivals by Air)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
O'ahu	5,06,708	4,67,959	2,36,640	3,601	7,365	13,029	16,448	16,917	11,885	36,009	76,662	1,13,090	15,06,316
Maui	2,43,086	2,34,823	1,25,353	624	1,131	1,988	2,568	2,453	2,479	23,178	63,748	91,171	7,92,602
Moloka'i	6,858	5,089	2,384	31	76	114	225	109	75	375	640	1,050	17,025
Lāna'i	6,066	6,146	2,604	21	26	64	121	81	39	595	904	1,257	17,924
Kaua'i	1,13,796	1,10,478	56,725	306	603	1,068	1,349	1,342	1,096	11,249	28,487	3,762	3,30,263
Hawai'i Island	1,65,297	1,48,204	77,933	701	1,300	2,605	3,608	3,683	3,642	10,641	28,056	48,147	4,93,817

2020 Visitor Average Length of Stay by Island and Month (Arrivals by Air)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
O'ahu	7.20	6.64	7.27	25.82	26.00	23.92	21.65	26.94	26.77	14.51	11.27	11.00	8.52
Maui	9.04	8.36	8.43	21.13	28.22	27.23	24.31	27.06	35.42	13.51	11.17	10.91	9.53
Moloka'i	5.24	5.51	5.93	6.94	25.37	24.49	16.42	13.19	34.45	19.62	12.89	11.06	6.93

... | China | Korea | Taiwan | Europe | Latin America | Exp by MMA | Exp by Island | Days by Island | CRUISE

Expected Output: -

	Island Name	Month	Number of Visitors
1	O'ahu	JAN	3647908
2	O'ahu	FEB	3106258
3	O'ahu	MAR	1719457
4	O'ahu	APR	92974
5	O'ahu	MAY	191462
6	O'ahu	JUN	311721
7	O'ahu	JUL	356088
8	O'ahu	AUG	455805
9	O'ahu	SEP	318122
10	O'ahu	OCT	522327
11	O'ahu	NOV	863638
12	O'ahu	DEC	1243871
13	Maui	JAN	2197687
14	Maui	FEB	1962660
15	Maui	MAR	1057111
16	Maui	APR	13195
17	Maui	MAY	31900
18	Maui	JUN	54141
19	Maui	JUL	62432
20	Maui	AUG	66381
21	Maui	SEP	87807
22	Maui	OCT	313046
23	Maui	NOV	712026
24	Maui	DEC	994709
25	Moloka'i	JAN	35919
26	Moloka'i	FEB	28029
27	Moloka'i	MAR	14135
28	Moloka'i	APR	212

BDAT 1010
Business Intelligence

10. Transform the below dataset using Power Query transformation.

Input Dataset: -

Col1	Col2	Col3	Col4	Col5	Col6	Col7
	2020			2021		
	Technology	Office Supplies	Furniture	Technology	Office Supplies	Furniture
Jan	433.2	255.4	2.6	4.7	93.9	122.8
Feb	435.0	229.1	2.1	5.7	83.4	97.4
Mar	409.3	230.7	1.9	6.3	74.2	89.2
Apr	377.6	209.2	2.0	4.4	87.9	86.4
May	403.4	226.0	1.2	5.8	86.3	83.4
Jun	471.8	260.0	2.2	3.8	106.5	121.9
Jul	540.5	272.1	2.4	3.4	106.5	116.5
Aug	485.5	243.6	2.4	3.4	100.3	120.3
Sep	432.8	183.4	1.7	3.3	83.7	95.6
Oct	442.7	234.1	2.3	4.6	88.1	108.9
Nov	419.6	197.8	2.1	4.8	80.9	116.5
Dec	532.8	260.0	2.5	6.4	96.2	133.5

Note: Use “Enter Data” option to create the above table in Power BI.

BDAT 1010
Business Intelligence

Expected Output: -

	Year	Product	Month	Sales
1	2020	Technology	Jan	433.2
2	2020	Technology	Feb	435
3	2020	Technology	Mar	409.3
4	2020	Technology	Apr	377.6
5	2020	Technology	May	403.4
6	2020	Technology	Jun	471.8
7	2020	Technology	Jul	540.5
8	2020	Technology	Aug	485.5
9	2020	Technology	Sep	432.8
10	2020	Technology	Oct	442.7
11	2020	Technology	Nov	419.6
12	2020	Technology	Dec	532.8
13	2020	Office Supplies	Jan	255.4
14	2020	Office Supplies	Feb	229.1
15	2020	Office Supplies	Mar	230.7
16	2020	Office Supplies	Apr	209.2
17	2020	Office Supplies	May	226
18	2020	Office Supplies	Jun	260
19	2020	Office Supplies	Jul	272.1
20	2020	Office Supplies	Aug	243.6
21	2020	Office Supplies	Sep	183.4
22	2020	Office Supplies	Oct	234.1
23	2020	Office Supplies	Nov	197.8
24	2020	Office Supplies	Dec	260
25	2020	Furniture	Jan	2.6

Part 1: DAX

1. Sort the month name as shown in the snapshot using Power BI DAX. [Use Q1 sheet from DAX_Data.xlsx file].

BDAT 1010
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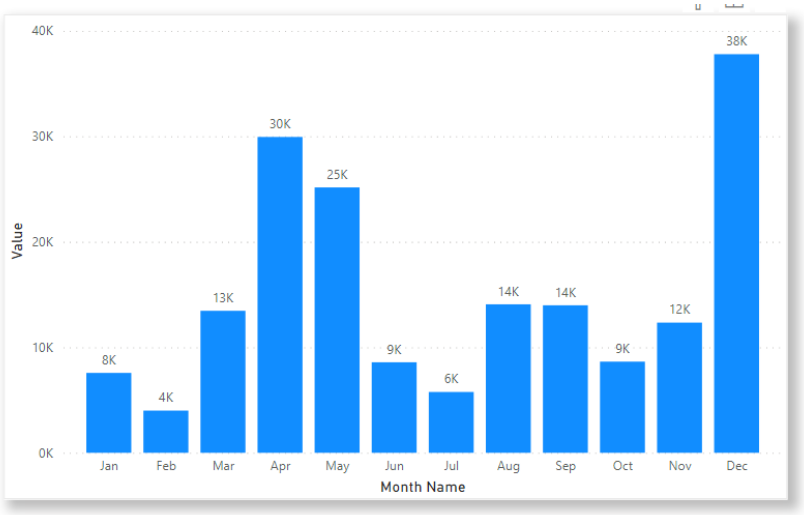
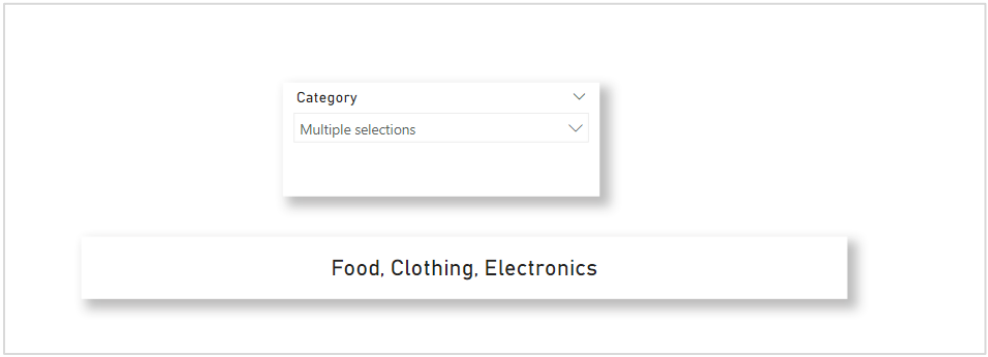


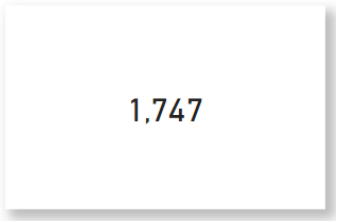
2. Capture the Values selected from the slicer, if nothing is selected then show “All”. Use card visuals to display the value. [Use Q2 sheet from DAX_Data.xlsx].



3. Use the DAX function to extract the Item name, Item ID, and Price from the “Item Description” column (which contains a combination of Item Name, Item ID, and price). [Use Q3 sheet from DAX_Data.xlsx].

Items Description(Name.ID.Price)	Item Name	Item Id	Price
Clothing.ITM1002.600	Clothing	ITM1002	600
Electrical.ITM1004.800	Electrical	ITM1004	800
Electronics.ITM1003.400	Electronics	ITM1003	400
Food.ITM1001.500	Food	ITM1001	500
Furniture.ITM1005.700	Furniture	ITM1005	700

4. Write a DAX function to calculate sum of Budget cost where [Type] = Capex and [Period] = Total. [Use Q4 sheet from DAX_Data.xlsx].



5. Calculate the MAX of the number after multiplying with a constant value and put this into a column say as MAX_Value, use the formula for the calculation as shown below-
MAX_Value = MAXX([M] * 1750, [W]* 1, [V] * 330)
Note: S, M, W, and V are the column name. [Use Q5 sheet from DAX_Data.xlsx].

Input Data:

S	M	W	V
1	15	500	60
2	10	60000	2
3	12.5	284000	300
4	5	4200	360
5	10	40250	240

Expected Result

M	W	V	Max_Value
26250	500	19800	26250
17500	60000	660	60000
21875	284000	99000	284000
8750	4200	118800	118800
17500	40250	79200	79200

6. The table is having item name column, add two columns based on the following value, 1st column contains a value based on the distinct item and 2nd column contains a value based on the item by skipping the row if there is a tie as shown in the screenshot below. [Use Q6 sheet from DAX_Data.xlsx].

See documentation on RankX function -

ties

(Optional) An enumeration that defines how to determine ranking when there are ties.

enumeration	Description
Skip	The next rank value, after a tie, is the rank value of the tie plus the count of tied values. For example if five (5) values are tied with a rank of 11 then the next value will receive a rank of 16 (11 + 5). This is the default value when *ties* parameter is omitted.
Dense	The next rank value, after a tie, is the next rank value. For example if five (5) values are tied with a rank of 11 then the next value will receive a rank of 12.

BDAT 1010
Business Intelligence

Input Data:

Item ID	Item Name
1	Apple
2	Apple
3	Banana
4	Banana
5	Candy
6	Candy
7	Candy

Expected Result

Item ID	Item Name	ID1	ID2
1	Apple	1	1
2	Apple	1	1
3	Banana	2	3
4	Banana	2	3
5	Candy	3	5
6	Candy	3	5
7	Candy	3	5

7. Create a bar graph as shown below with previous year and present year sales month on month basis. [Use Q7 sheet from DAX_Data.xlsx].

8. Write a DAX function to create a filter (Region= “South”) set of rows from an existing table to a new table as shown in the snapshot below. [Use Q8 sheet from DAX_Data.xlsx].

BDAT 1010
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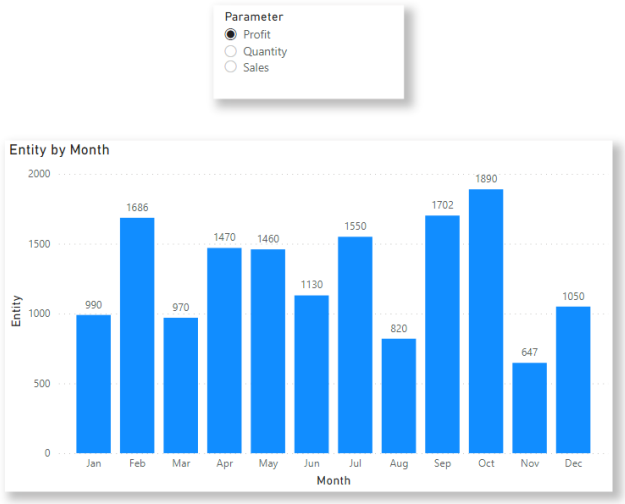
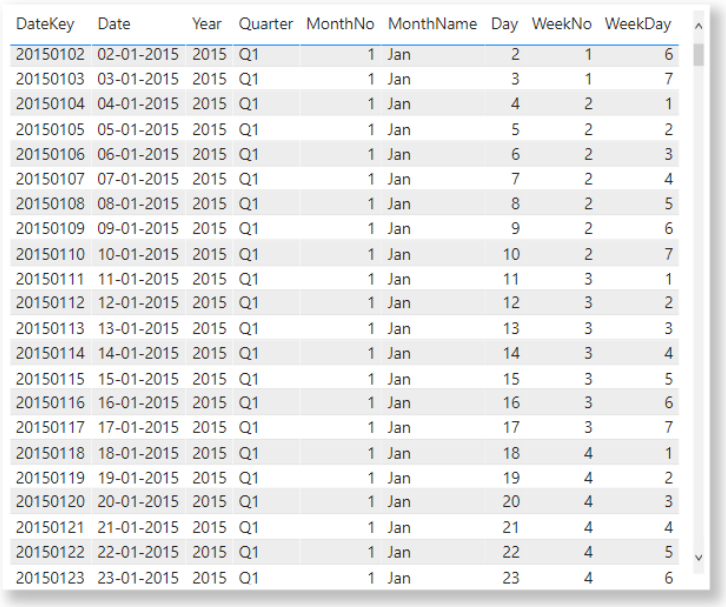
ID	Region	State	Sales
1	South	Brighton and Hove	1500
2	South	Milton Keynes	2600
3	South	Southampton	3600
4	South	Portsmouth	4100
5	South	Slough	5100
6	South	Reading	3600
7	South	Oxford	7400
8	South	High Wycombe	8000
9	South	Basingstoke	6300
10	South	Maidstone	9000
11	South	Crawley	4000
12	South	Worthing	3200
13	South	Gillingham	1253
14	South	Eastbourne	2000
Total			**61653**

9. Create a bar graph as shown below with swapping axis as profit, sales, or quantity on a parameter(slicer). [Use Q9 sheet from DAX_Data.xlsx].



10. Generate a calendar table that has the following columns-
    Date: containing a date value
    DateKey: containing a date in integer format, ex- 26-05-2022→ 20220626
    Year: containing a year value from date
    MonthNo: containing a month number from date
    MonthName: containing month name from date
    Day: containing day from date
    Quarter: containing quarter from date
    WeekNo: containing week no from date
    WeekDay: containing week day from day

BDAT 1010
Business Intelligence



DateKey	Date	Year	Quarter	MonthNo	MonthName	Day	WeekNo	WeekDay
20150102	02-01-2015	2015	Q1	1	Jan	2	1	6
20150103	03-01-2015	2015	Q1	1	Jan	3	1	7
20150104	04-01-2015	2015	Q1	1	Jan	4	2	1
20150105	05-01-2015	2015	Q1	1	Jan	5	2	2
20150106	06-01-2015	2015	Q1	1	Jan	6	2	3
20150107	07-01-2015	2015	Q1	1	Jan	7	2	4
20150108	08-01-2015	2015	Q1	1	Jan	8	2	5
20150109	09-01-2015	2015	Q1	1	Jan	9	2	6
20150110	10-01-2015	2015	Q1	1	Jan	10	2	7
20150111	11-01-2015	2015	Q1	1	Jan	11	3	1
20150112	12-01-2015	2015	Q1	1	Jan	12	3	2
20150113	13-01-2015	2015	Q1	1	Jan	13	3	3
20150114	14-01-2015	2015	Q1	1	Jan	14	3	4
20150115	15-01-2015	2015	Q1	1	Jan	15	3	5
20150116	16-01-2015	2015	Q1	1	Jan	16	3	6
20150117	17-01-2015	2015	Q1	1	Jan	17	3	7
20150118	18-01-2015	2015	Q1	1	Jan	18	4	1
20150119	19-01-2015	2015	Q1	1	Jan	19	4	2
20150120	20-01-2015	2015	Q1	1	Jan	20	4	3
20150121	21-01-2015	2015	Q1	1	Jan	21	4	4
20150122	22-01-2015	2015	Q1	1	Jan	22	4	5
20150123	23-01-2015	2015	Q1	1	Jan	23	4	6

Deliverable

1. Its individual assignment. Submission report must be PDF format.
2. Two files need to be uploaded one .pbix file and one PDF report (screen shots with timestamp.). Screen shots must be below each question.
3. Use this document as template
4. Rubrics: each question worth one mark
5. All screen shots must have time stamp, otherwise you do not get mark
6. There will be 20% deduction for each day delay. After five days I do not accept the assignment and you get zero.