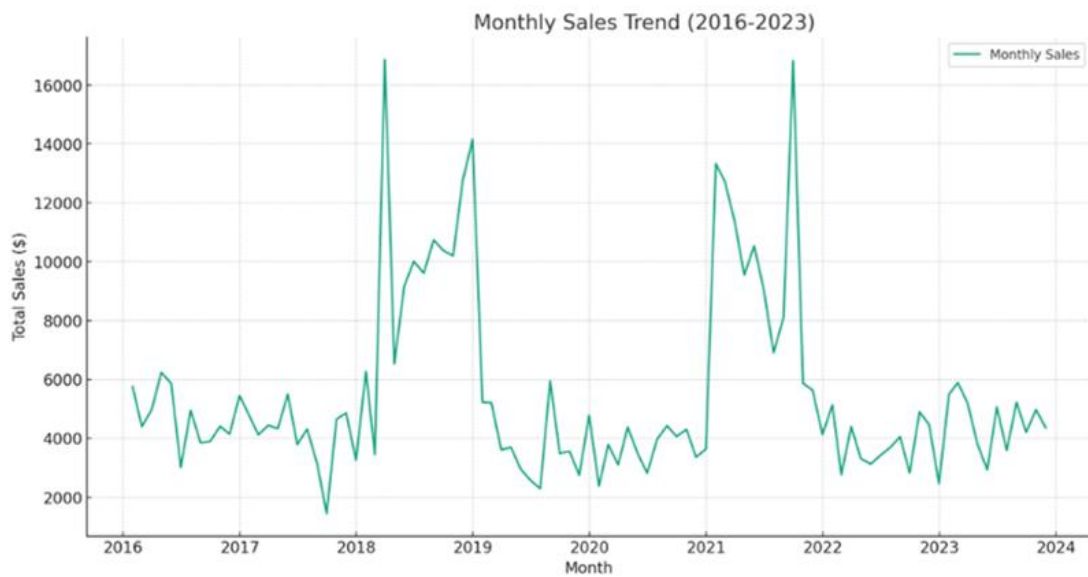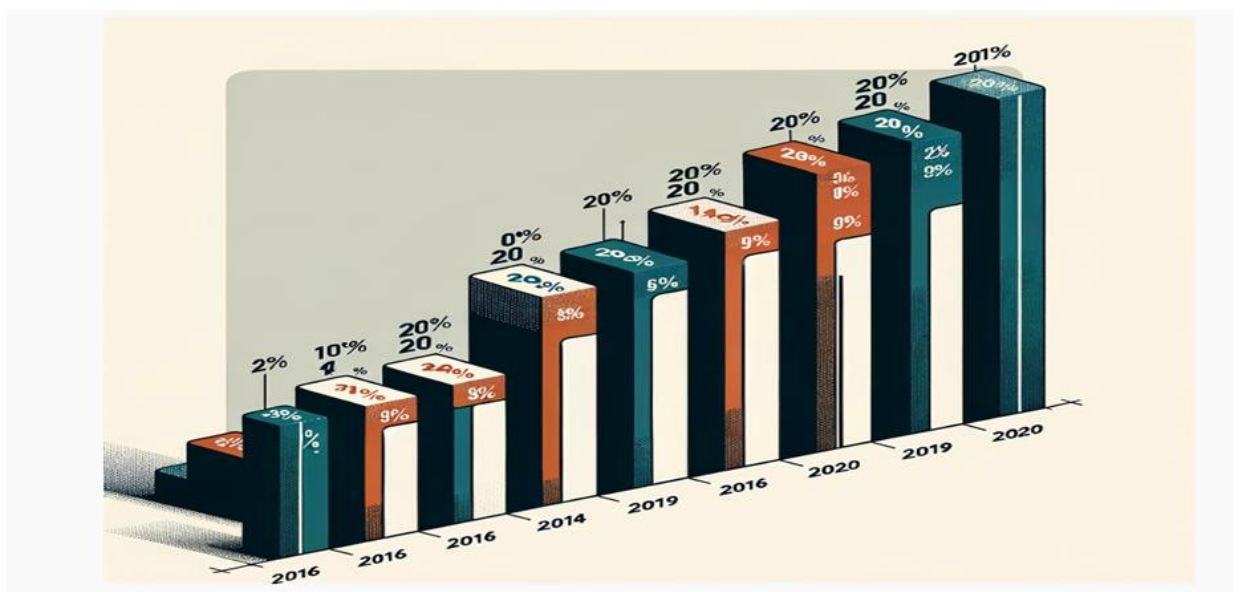**Q1.**

Monthly Sales Trend (2016-2023)

Chart A Monthly Sales Trend from 2016 to 2024

Chart A shows the monthly sales trend over the years. Which **TWO** years did the peaks sales exceed $12,000?
A) 2017
B) 2018
C) 2020
D) 2021
E) 2022
Answer : BD

Q2.

Chart B: Total Annual Sales by years

Based on the chart, which **TWO** data visualizations rules are MOST likely violated?

    A. Gestalt Principle of Continuity

    B. Gestalt Principle of Closure

    C. Data to Ink ratio

    D. Gestalt Principle of Similarity

    E. Chart Junk

Answer : CE

Q3.

Which of the following **TWO** statements are the TRUE reasons that report use data from the data warehouse?

A. Data warehouses store real-time data that is immediately updated as transactions occur, ensuring that reports reflect live operational data.

B. Data warehouses integrate data from multiple sources into a single, coherent framework, ensuring consistency and a single version of truth

C. Data warehouses use simple, flat-file structures that are optimized for quick and easy data entry by end-users. Hence the data in warehouse are real time update such that the report is accurate.

D. Data warehouses are designed to handle complex queries and large volumes of data efficiently. This optimization ensures that reports can be generated quickly, even when they require aggregating and analyzing vast amounts of information.

E. Data warehouses are designed to store individual transaction-level data only, which is ideal for detailed operational reporting.

Answer: BD

Q4.

What are the **TWO** reasons why organizations make use of Business Intelligence to make decisions?

A. Business Intelligence systems are primarily used for their advanced graphic design capabilities, enabling organizations to create visually appealing reports without regard to data accuracy.

B. Organizations use Business Intelligence to completely automate decision-making, eliminating the need for human judgment and expertise in the process.

C. BI provides valuable insights and predictive analytics, but it cannot guarantee accurate predictions of future events with certainty. It helps in making educated guesses based on data patterns.

D. Organizations use Business Intelligence to analyse historical and current data, identify trends, and make informed predictions about future events, enhancing strategic decision-making.

E. Business Intelligence tools aggregate data from various sources, providing a consolidated view that helps organizations gain insights into their operations and market, leading to data-driven decisions.

Answer: DE

Q5.

What are **TWO** reasons that Interquartile range (IQR) are better to evaluate the data compared to standard deviation?
A. The IQR is a better measure than standard deviation for evaluating data with outliers or a non-normal distribution because it is not as sensitive to extreme values, which can distort the picture of variability.

B. The IQR is superior because it accounts for every single value in the data set, ensuring no data point is ignored, whereas standard deviation only considers points near the mean.

C. IQR gives a measure of the middle 50% of the data, providing a clearer picture of the dataset's central tendency when the data contains outliers or is not symmetrically distributed.

D. The IQR is the only measure that can be graphically represented, whereas the standard deviation cannot be visually represented.

E. IQR is preferred for large data sets because it uses complex calculations that consider the tails of the distribution, making it more accurate than the standard deviation.

Answer: AC

Q6.

Given the following sets of functions from PowerBI, Tableau and SAS Viya.
Choose the **most appropriate** function to answer the following questions.

Type in the answer based on the letters in **BOLD**.
For example, if the answer is 'MAX' , type in **A** as the answer, instead of the keyword.
 Marks may not be awarded if the keyword is typed into the blank. Options can be repeated.

A.	MAX	G.	Sum
B.	Concatenate	H	Average
C.	Count	J	Substring
D.	DateDiff	K	Date
E.	LEFT	L	Len
F.	RIGHT	M	MID

a.	In PowerBI, F return the. last 3 characters from a string.
b,	In PowerBI, use B to return a string that are joined by two strings value.
c.	In PowerBI, use D to return the age at the time of report generation from the date of birth.
d.	In Tableau, use C to return the number of orders made by a customer.
e.	In Tableau, use H to get the mean of all sales transections.
f.	In Tableau, use G to return the Total Profit made by a product.
g.	In SAS, extract a portion of characters 'Hand' from with a string 'John is Tall and Handsome', you need to use J

Q7.

Choose the **most appropriate** function to answer the following questions.
Type in the answer based on the letters in **BOLD**.
For example, if the answer is 'NOMINAL', type in **A** as the answer, instead of the keyword.

Marks may not be awarded if the keyword is typed into the blank. Options can be repeated.

A	Nominal	**G**	Knowledge
B	Ordinal	**H**	Wisdom
C	Ratio	**K.**	Gestalt Principle of Continuation
D	Interval	**L**	Gestalt Principle of Similarity
E	Data	**M**	Data Ink Ratio
F	Information	**N**	Data Integrity

a.	Educational levels (e.g., elementary, middle school, high school, college) represent B data type because the levels are ranked.
b.	Data collected on the brand preference of consumers (e.g., Nike, Adidas, Reebok) where the categories do not have a meaningful order or ranking. Then the category is classified as A data type.
c.	In DIKW hierarchy, H sits at the tops as requires extensive insight from the experience.
d.	F is processed data that provide added context and is meaningful to people that received it.
e.	Data can be ordered and has consistent interval and has a true point zero point, this is known as C data type.

1 frog image = 5 frogs

Jan   Feb   Mar   Apr   May   Jun   Jul

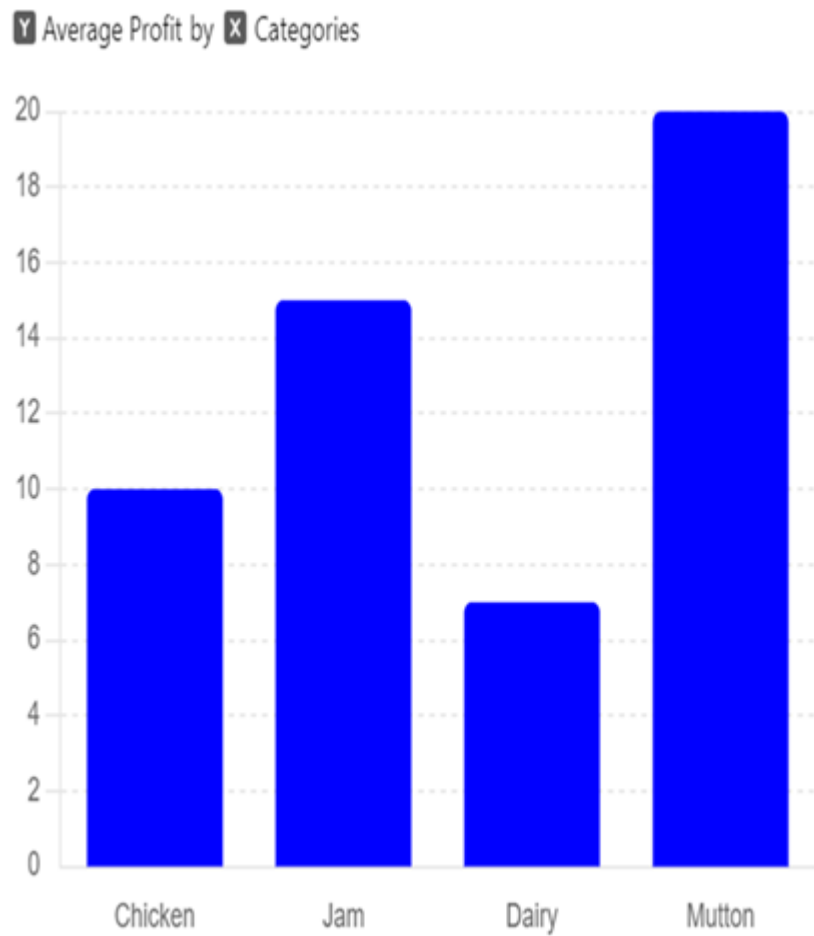Month
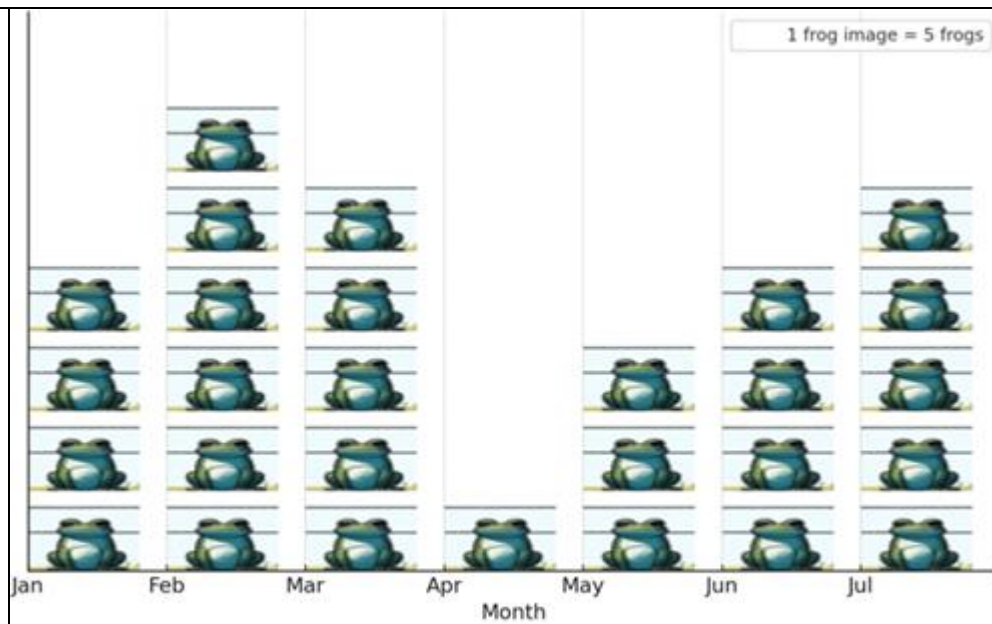
Chart C Frogs in the Pond

Each frog image represents 5 frogs in a pond in Chart C.
The above chart C was redrawn to the following chart D.
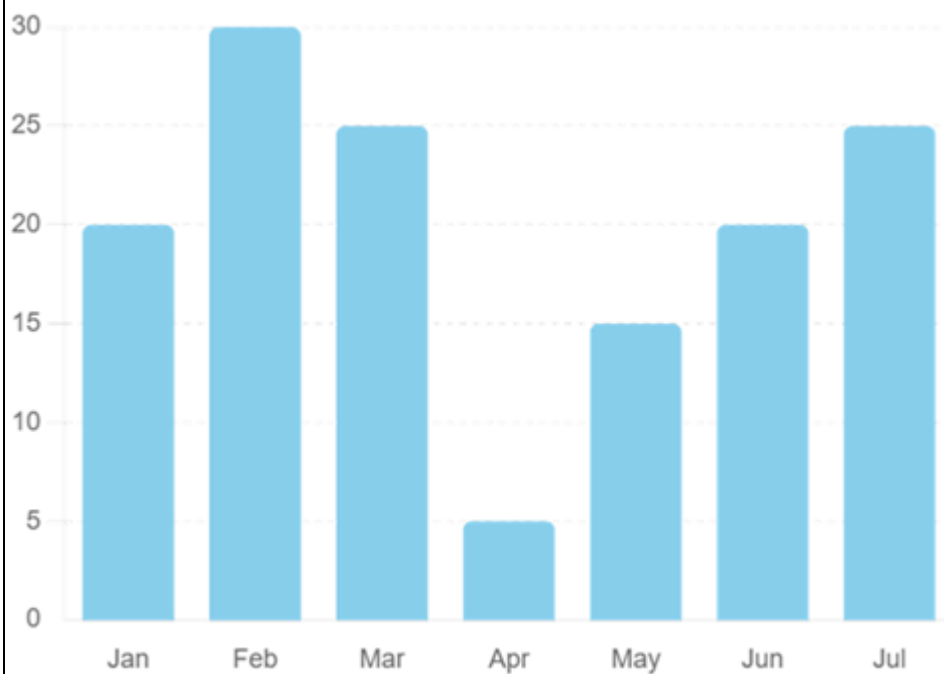
Chart D: Frogs in the pond

Chart D has handled the M issue of Data Visualization of Chart C.
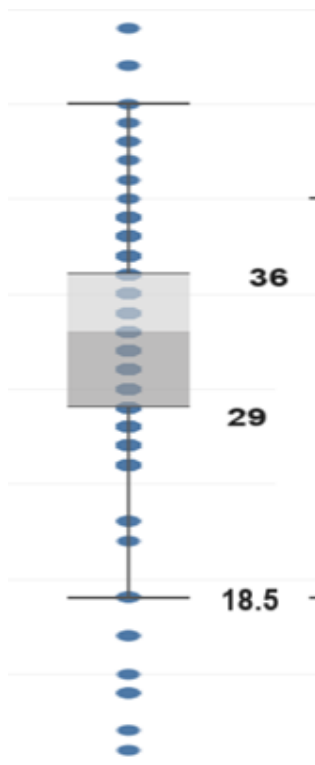
g.

Chart E: Average Profit by Food Categories

This chart had violated the K of visualization. |

Q8.

Chart F: Singapore Jul 2021 Temperature Reading

Lower Quartile	29C
Upper Quartile	36C
Minimum	18.5

Minimum, Lower and Upper Quartile of the temperature in July 2021

Chart F shows the temperature readings for Singapore in July 2021, recorded at 5-minute intervals. There are some erroneous readings considered outliers, such as extremely high (e.g. 60°C) or low temperatures (e.g. -5°C). Complete the following **formula** (excluding these outliers) e.g. Standard Deviation = √varience

	Formula

Interquartile Range (IQR)	Upper Quartile – Lower Quartile
Maximum	Upper Quartile + 1.5 * (IQR)
Range	Maximum – Minimum

Section D

Answer **ALL** the questions in this section using the following dataset (A to F)

Dataset	Data	Std Dev
A	30, 21, 59, 45, 20, 10, 13, 40, 30, 11, 13, 13, 30, 13	14.38
B	60, 35, 34, 23, 23, 47, 23, 48, 31, 33, 32, 35, 30, 49	11.12
C	120, 40, 56, 95, 61, 67, 69, 40, 66, 30, 59, 66, 73, 90	23.55
D	17, 34, 36, 36, 19, 35, 16, 22, 22, 17, 22, 36, 18, 19	8.32
E	66, 95, 76, 50, 76, 59, 59, 69, 65, 55, 59, 90, 100, 68	14.71
F	44, 99, 47, 47, 10, 30, 30, 5, 44, 200, 47, 42, 42, 30	46.24

Q9.

What are the following values for **dataset A**?

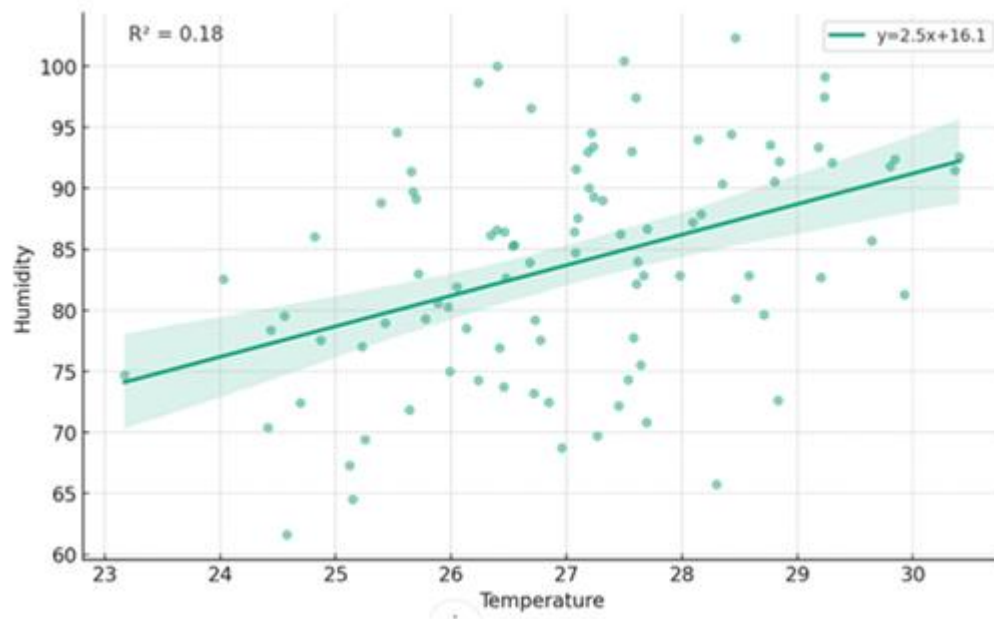|	(Up to 2 decimal pt)
Mean	24.86
Median	20.5
Lower Quartile	13

Q10.
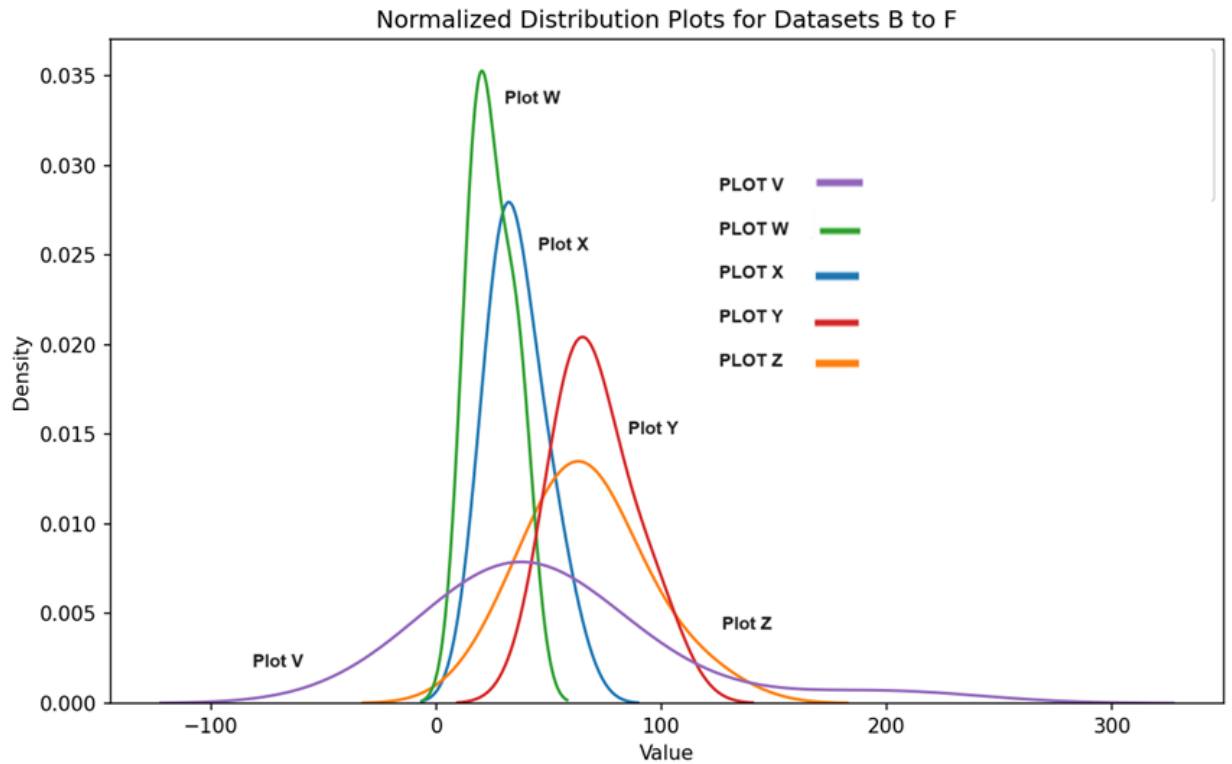
Chart G: Normal distribution Plots for Datasets B to F

Given the distribution plot based on the datasets (B to F), identify which plot represents the respective datasets (B to F):

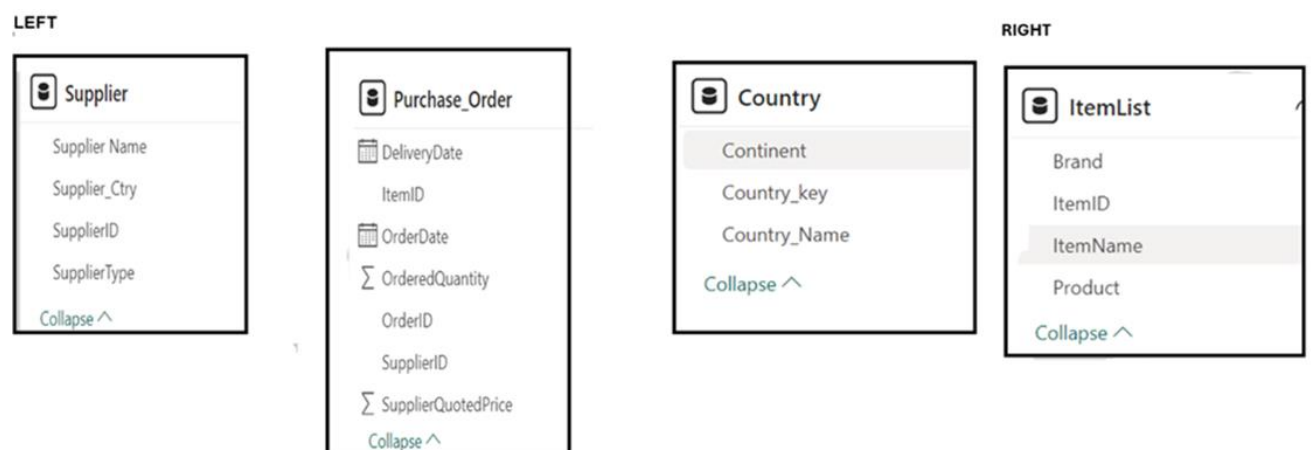| Dataset	Plot
C	Z
D	W
F	V

Q11.

Chart H: Singapore Humidity vs Temperature

a. If the humidity is 85%, what is the corresponding temperature? (All formula and working must be shown, up to 2 decimal points) (3marks)

b. Based on the data given what is the correlation between humidity and temperature? Explain your answer.(2 marks)

Q12.

**Image J: List of Tables in a Procurement System**

These are supplier type that are available:

SupplierType
Manufacturer
Wholesaler
Distributors
Dropshippers
Importer/Exporter
Consignment
Local

Background to the report:

- Each supplier is related to a country and vice versa.

- There will be cases where supplier was not given any purchase order.

- Each purchase order is indicated with a supplier.

- Report should not consist of local supplier type
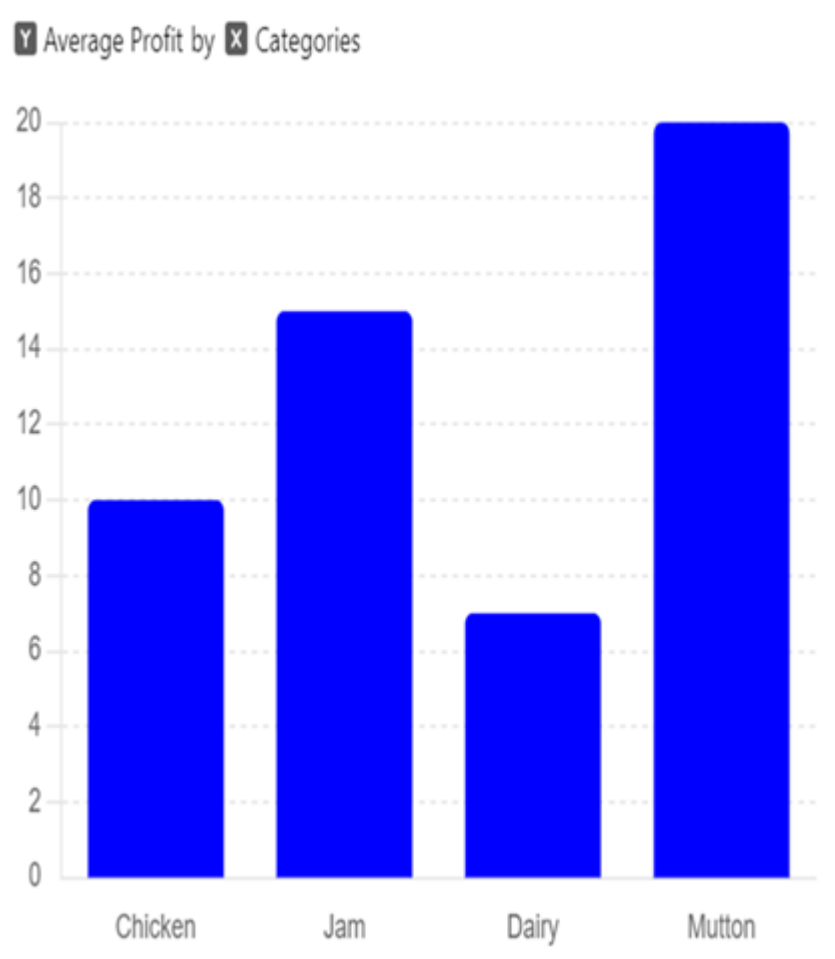
- Chart is created in Tableau

Breakdown of Total Purchase by Supplier Type and Continent
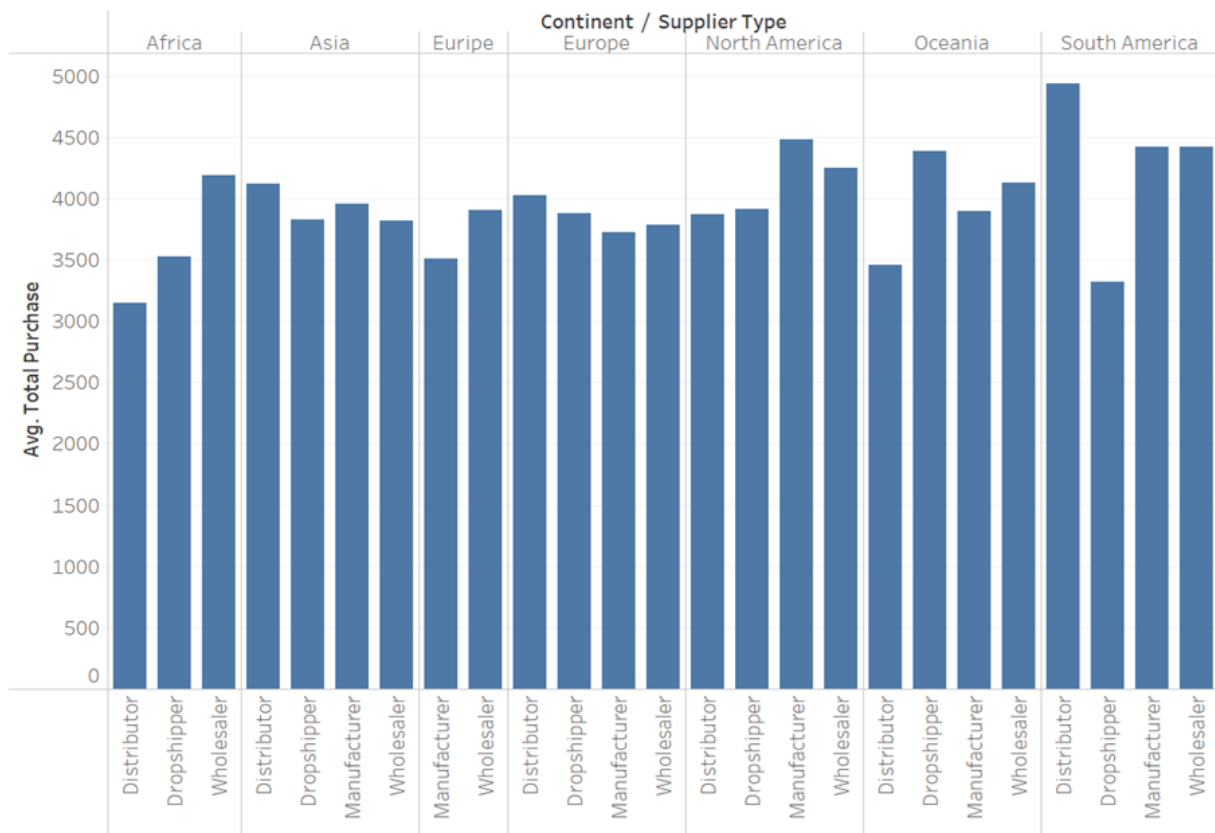
Chart J: Breakdown of Total Purchase by Supplier Type and Continent

List the steps needed to create the chart J, use JOIN statements for combining tables if required. Do not use relationships.
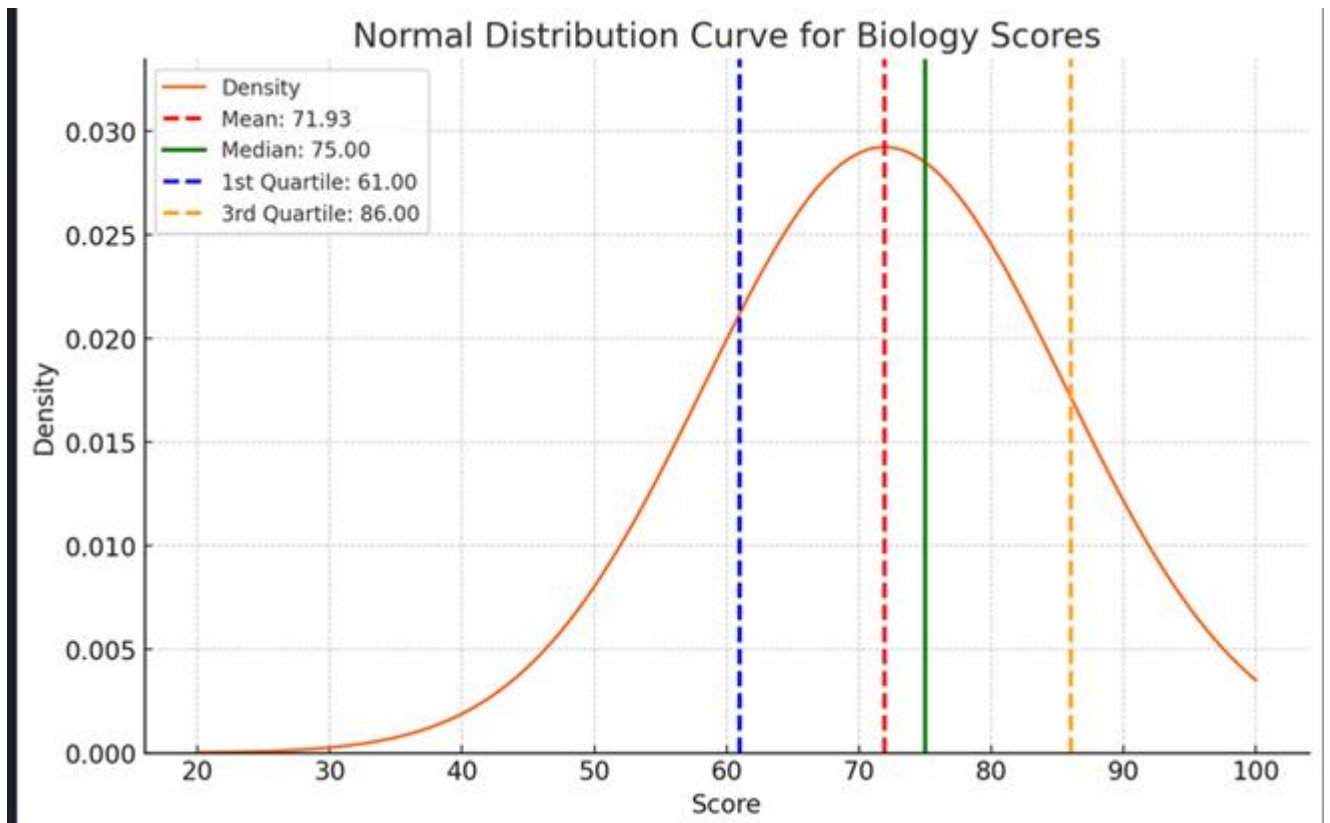
Q13.

Y Average Profit by **X** Categories

Chart K: Total Profit By Sweet Categories

Given the above chart K, answer the following questions:
a. Give ONE situation and explain why Total Profit is not a good indicator for assessing the performance of different sweet categories? (2 mark)

b. How would your address the limitation highlighted in (a)? Explain your answer.
(2marks)

Q14.

Chart L: Distribution of Scores for Biology Examination

a. Based on the given examination score (0 to 100), provide and explain **ONE** insight on the students' performance in the biology examination. (2 marks)

b. Is it true that 75% of the students score less than 90 marks? Explain your answer (2 marks)