Date _____

Expt. No. _____ Page No. 01.

PART - A : Spreadsheet (Excel)

Data preprocessing, interpretation and analytical functions

Data Set :

	A	B	C	D	E	F	G	H
1	Subject - Wise Workload dataset							
2	Coll ID	Coll Name	Subject	Full WL	Partial WL	Total WL	WL Type	Concatenate Coll ID
3	299	AKCW299	Python	1	0			
4	4	AKCW4	Chemistry	1	0			
5								
6								
7								
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
40	23	AKCW23	Business	2	1			

A). Conditional Formatting :

	D	E
2	Full WL	Partial WL
3	1	0
4	1	0
5	1	1
6	4	1
7	7	0
⋮	⋮	⋮
40	2	1

Date

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01) Demonstrate Conditional formatting, IF(), COUNTIF(), SUMIF(), AVERAGE(), CONCATENATE()

Soln:- To demonstrate the above mentioned functionalities, we have considered, "Subject wise workload" Sample dataset. This dataset is having 38 Rows and 7 Columns. They are,

- → Coll ID
- → Coll Name
- → Full Workload
- → Partial Workload
- → Total Workload
- → Workload Type
- → Concatenate Coll ID and Coll Name

A). Conditional Formatting :

Conditional formatting is used to change the appearance of cells in a range based on your specified conditions.

→ In the considered dataset, Conditional formatting is applied on Full workload (Col D) and partial workload (Col E) columns.

Step 1 : Select Col 'D' and Col 'E' data Columns.

Step 2 : Go to home Tab → Style Group → Conditional formatting options, click it.

Step 3 : From the dropdown, click on the rule you wish to apply highlight the cell → Greater than Condition is "Greater than" > 5.

Step 4 : Changes are reflected on Col 'D' and Col 'E'.

Horizon

Teacher's Signature

B) IF() Function :

	A	B	C	D	E	F	G	H
2	Coll ID	Coll Name	Subject	Full WL	Partial WL	Total WL	WL Type	Concatenate Coll ID
3	299	AKCW299	Python	1	0	1	full + Partial	
4	4	AKCW4	Chemistry	1	0	1	full + Partial	
5			Python	1	1	2	Only full	
6								
7								
40	23	AKCW23	Business	2	1	3	Only full	

C) COUNTIF() function :

1. Number of College offering each subject using COUNTIF().

	J	K	L
16	SL NO	Name	No.of.College
17	1	Chemistry	3
18	2	Python	4
19	3	Business	2

Date

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B) IF() Function :

The IF() function is a predefined function in Excel, which returns values based on true or false.

This function is applied on col 'G' -> for finding the workload Type (WL Type).

Syntax :=IF(logical_test, [value_if_true], [value_if_false])

Where, • logical_test = Condition.
• Value_if_true = Statement display if Condition is true.
• Value_if_false = Statement display if Condition is false.

Example :=IF(E3:E40, "Only Full", "Full + Partial")

C) COUNTIF() Function :

The COUNTIF() function in Excel Counts the number of cells within a range based on Pre-defined Criteria.

Syntax :=COUNTIF (range, criteria)

where, • range = define 1 or more cells to Count.
• Criteria = The Condition that tells the function, which cells to Count.

Horizon

Teacher's Signature

D) SUMIF() function :

	F	K
2	Total WL	SUMIF
3	1	2
4	1	17
5	2	0
6	5	12
7	7	19
:	:	:
40	3	4

E) AVERAGE() Function :

	D	E	L
2	Full WL	Partial WL	AVerage()
3	1	0	0.5
4	1	0	2.5
5	1	1	1
6	4	1	3.5
7	7	0	
:	:	:	:
40	2	1	

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Example :-=COUNTIF(C3:C40, 14:16)

D) SUMIF() Function :

The SUMIF() is a pre-defined function in Excel, which calculates the sum of values in a range based on a True or false condition.

Syntax :-=SUMIF(range, criteria, [sum_range])

Where, • range = range of data to apply SUMIF()
• Criteria = which can check thing like =, <, >
• [sum_range] = The range where the function calculates the sum.

Example :-
=SUMIF(F3:F40, "<2")
=SUMIF(F3:F40, ">1"), =SUMIF(F3:F40, "<=2")

E) AVERAGE() Function :

The AVERAGE() function is a premade function in Excel, which calculates the average (arithmetic mean).
It adds the range and divides it by the number of observations.

Syntax :-=AVERAGE(number1, [number2], ...)

Example :-=AVERAGE(D3, E3), =AVERAGE(D6, E6), =AVERAGE(D5, E5), =AVERAGE(D7, E7)

Horizon

Teacher's Signature

F) CONCATENATE() Function:

	A	B	C	D	E	F	G	H
2	Coll ID	Coll Name	Subject	Full WL	Partial WL	Total WL	WL Type	Concatenate() Coll ID & WL TYPE
3	299	AKCW299	Python	1	0	1	Full + Partial	299/Full+ Partial
4	4	AKCW4	chemistry	1	0	1	Full + Partial	4/Full+ Partial
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
40	23	AKCW23	Busines	2	1	3	Only full	23/Only full

Date

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F) CONCATENATE() function :

The Concatenate is just another way of saying "to Combine" or "to join together".

Syntax :- =Concatenate (text 1, [text 2], ...)

where, • text 1 = The first item to join (text, Value, number, Cell reference).

• text 2 = Combine with text 1

Example :- =CONCATENATE (A3, "/", G3)
=CONCATENATE (A4, "/", G4)
=CONCATENATE (A40, "/", G40)

Horizon

Teacher's Signature

A) LEFT() Function :

	C	I
2	Subject	LEFT()
3	Python	Py
4	chemistry	chem

B) MID() Function :

	C	K
2	Subject	MID()
4	chemistry	hemis
7	Python	thon

Date

Expt. No. 02. Page No. 06.

02) Demonstrate LEFT, MID, RIGHT, LEN, SUBSTITUTE, SEARCH, ISNUMBER.

A) LEFT() Function :

The 'LEFT' function is used to extract a specified number of characters from the beginning (left side) of a text string.

Syntax :

=LEFT(text, num_chars)

where, • text : This is the text string from which you want to extract characters.

• num_chars : This is the number of characters you want to extract from the left side of the text.

Example :- =LEFT(C3, 2), =LEFT(C4, 4)

B) MID() Function :

The MID() function is used to extract a specific number of characters from a text string, starting at a specified position.

Syntax :- =MID(text, Start_num, num_chars)

where, • text : This is the text string from which you want to extract characters.

• Start_num : This is the starting position in the text string from which you want to begin extraction.

• num_chars : This is the number of characters you want to extract.

Example :- =MID(C4, 2, 5), =MID(C7, 3, 5)

Horizon

Teacher's Signature

C) RIGHT() Function :

	C	J
2	Subject	RIGHT()
3	Python	on
4	Chemistry	stry

D) LEN() Function :

	C	L
2	Subject	LEN()
3	Python	6
4	Chemistry	9

Date

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C) RIGHT() Function :

The 'RIGHT()' function in Excel is used to extract a specified number of characters from the right side of a text string.

Syntax :- =RIGHT(text, num_chars)

Where, • text = The text string you want to extract from,

• num_chars = is the number of characters you want to retrieve from the right end of the text.

Example :- =RIGHT(C3,2), =RIGHT(C4,4)

D) LEN() Function :

The 'LEN()' Function in Excel is used to count the number of characters in a text string.

Syntax :- =LEN(text)

Where., • text = The text string for which you want to determine the length.

Example :- =LEN(C3), =LEN(C4)

E) SUBSTITUTE() Function :

The 'SUBSTITUTE()' function is used to replace occurrences of a specified substring with another substring in a given text string.

Syntax :- =SUBSTITUTE(text, old_text, new_text, [instance_num])

Horizon

Teacher's Signature

E) SUBSTITUTE() Function :

	C	M
2	Subject	SUBSTITUTE()
6	Computer sci	Computer applications
3	Python	java

F) SEARCH() Function :

	C	N
2	Subject	SEARCH()
3	Python	2
4	Chemistry	4

Date

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where., • text = The original text string where you want to replace occurrences.
• old_text = The substring you want to replace.
• new_text = The new substring that will replace 'old_text'.
• [instance_num] = (optional) : Specifies which occurrence of 'old text' to replace.

Example : =SUBSTITUTE(C6, "sci", "applications")
=SUBSTITUTE(C3, "Python", "java")

F) SEARCH() Function :

SEARCH() will return the position of a specified character or sub-string within a supplied text string.

Syntax : =SEARCH(find_text, within_text, [start_num])

where., • find_text = The text you want to find.
• within_text = The text containing the data you want to search.
• [Start_num] = (optional) : The starting number for the search within the 'within_text'.

Example : =SEARCH("m", C4), =SEARCH("y", C3)

G) ISNUMBER() FUNCTION :

The 'ISNUMBER()' function is used to check if a cell contains a numeric Value.

Horizon

Teacher's Signature

9) ISNUMBER() Function :

	A	C	D
2	CollID	Subject	ISNUMBER()
3	299		TRUE
5		Python	FALSE

Date

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It returns TRUE if the cell's content is a number and FALSE if it is not.

Syntax : =ISNUMBER(Value)

Where., • Value = The Value or cell reference you want to check.

Example : =ISNUMBER(A3)
=ISNUMBER(C5)

Horizon

Teacher's Signature

A) TODAY() Function :

= TODAY()

• 17-12-2023

B) NOW() Function :

= NOW()

• 17-12-23 19:24

C) YEAR() Function :

= YEAR(Serial_number)

= YEAR("17-Dec-23")

• 2023

Date

Expt. No. 03. Page No. 10.

03) Demonstrate TODAY, NOW, YEAR, MONTH, NETWORKDAYS, EOMONTH

A) TODAY() Function :

In Excel, the 'TODAY()' function returns the current date.

Syntax :- =TODAY()

Where, 'TODAY()' in a cell, it will display the current date. This date will automatically update every time you open or recalculate the spreadsheet.

Example : =TODAY()

B) NOW() Function :

In Excel, the 'NOW()' function is used to return the current date and time.

Syntax : =NOW()

Simply enter this formula in a cell, and it will display the current date and time.

Example : =NOW()

C) YEAR() Function :

The 'YEAR()' function is used to extract the year from a date.

Syntax : =YEAR(Serial_number)

Where., Serial_number : This is the date from which you want to extract the Year.

Example :- =YEAR("17-Dec-23")

Horizon

Teacher's Signature

D) MONTH() Function :

= MONTH("17-Dec-23")

. 12

E) NETWORKDAYS() Function :

= NETWORKDAYS("2-oct-23", "31-dec-23")

. 65

= NETWORKDAYS("2-oct-23", "31-dec-23", "01-NOV-23": "25-Dec-23")

. 63

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D) MONTH() Function :

The 'MONTH()' function is used to extract the month from a date.

Syntax :- = MONTH(serial_number)

where., • Serial_number : This is the date from which you want to extract the month.

Example : = MONTH("17-Dec-23")

E) NETWORKDAYS() Function :

The 'NETWORKDAYS()' function is used to calculate the number of whole workdays (Monday through Friday) between two dates, excluding specified holidays.

Syntax : = NETWORKDAYS(start_date, end_date, [holidays])

where., start_date : The start date of the period.

end_date : The end-date of the Period.

[holidays] : Optional Parameter where you can specify a range of cells containing holiday dates.

Example : = NETWORKDAYS("2-oct-23", "31-dec-23")

= NETWORKDAYS("2-oct-23", "31-dec-23", "01-NOV-23": "25-Dec-23")

F) EOMONTH() Function :

The 'EOMONTH()' function in Excel returns the serial number for the last day of the month that is a specified number of months

Horizon

Teacher's Signature

F) EOMONTH() Function :

	A	B
1	Start date	EOMONTH()
2	26-Jan-16	42429
3	1-Apr-23	45169
4	18-Aug-23	45138
5	10-Nov-23	45199

☆ After Converting Cell B Values to Date format :

	A	B
1	Start date	EOMONTH()
2	26-Jan-16	29-02-16
3	1-Apr-23	31-08-23
4	18-Aug-23	31-07-23
5	10-Nov-23	30-09-2023

Date

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before or after a specified date.

Syntax :- =EOMONTH(Start_date, months)

where, Start_date : The initial date.

months : The number of months before or after the start_date.

A positive Value for months yields a future date, & a negative Value yields a Past date.

Example : =EOMONTH(A2, 1), =EOMONTH(A3, 4)
=EOMONTH(A4, -1), =EOMONTH(A5, -2)

=> STEPS TO CONVERT A VALUES TO DATE FORMAT :-

1) Step 1 : Once you get your Values, Right click on the particular cell.
2) Step 2 : Click on Format Cell.
3) Step 3 : Under the Category Cell, Select as Date.
4) Step 4 : Then, select the type of format you want for example, DD-MM-YY or YY-MM-DD.
5) Step 5 : Click on OK. Then you will be getting the Date format.

Horizon

Teacher's Signature

A) VLOOKUP( ) Function :

A	B	C	E	F
Name	Date	Value		VLOOKUP
a	01-01-2022	1	C	3
b	26-01-2022	2		
c	22-02-2022	3		
d	23-02-2022	4		
e	11-03-2022	5		
f	14-03-2023	6		
g	25-03-2023	7		
h	28-03-2023	8		

B) HLOOKUP() Function :

A	B	C	E	F
Name	Date	Value		HLOOKUP
a	01-01-2022	1		
b	26-01-2022	2	Date	14-03-2023
c	22-02-2022	3		
d	23-02-2022	4		
e	11-03-2022	5		
f	14-03-2023	6		
g	25-03-2023	7		
h	28-03-2023	8		

Date

Expt. No. 04. Page No. 13

04) Demonstrate VLOOKUP, HLOOKUP, XLOOKUP, COUNT, COUNTA.

A) VLOOKUP( ) Function :

Looks for a value in the leftmost column of a table, and then return a value in the same row from a column you specify.

Syntax : =VLOOKUP(lookup_value, table_array, col_index_num, [range_lookup])

Example : =VLOOKUP(E44, A43:C51, 3, FALSE)

B) HLOOKUP( ) Function :

Looks for a value in the top row or array of values and returns the value in the same column from a row you specify.

Syntax : =HLOOKUP(lookup_value, table_array, row_index_num, [range_lookup])

Example : =HLOOKUP(E45, A43:C51, 7, FALSE)

Horizon

Teacher's Signature

c) XLOOKUP() Function :

	C	D	E	F
43	Value	Value		XLOOKUP
44	1	56		14-03-2023
45	2	22		
46	3	13	88	1103-2022
47	4	14	62	
48	5	66		
49	6	102		
50	7	36		
51	8	1		

D) COUNT() E) COUNTA()

	A	C	G	H
43	Name	Value	COUNT	COUNTA
44	a	1	8	9
45	b	2		
46	c	3	0	9
47	d	4		
48	e	5		
49	f	6		
50	g	7		
51	h	8		

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c) XLOOKUP() Function :

Searches a range or an array for a match and returns the corresponding item from a second range or array, by default, an exact match is used.

Syntax : =XLOOKUP(lookup_value, lookup_array, return_array, [if_not_found], [match_mode], [search_mode])

Example : =XLOOKUP(E46, D43:D51, B43:B51, "NOT FOUND", 1, 1)

= XLOOKUP(E47, D43:D51, B43:B51, "NOT FOUND", 1, 1)

D) COUNT() Function :

Counts the number of cells in a range that contain numbers

Syntax : =COUNT(Value 1, [Value 2], ...)

Example : =COUNT(C43:C51)

= COUNT(A43:A51)

E) COUNTA() Function :

Counts the number of cells in a range that are not empty.

Syntax : =COUNTA(Value 1, [Value 2], ...)

Example : =COUNTA(C43:C51)

= COUNTA(A43:A51)

Horizon Teacher's Signature

A) INDEX() Function :

	A	B	C	D	E
1		1	2	3	Index
2	1	name	Height	Weight	
3	2	Sally	6.2	185	5.8
4	3	tom	5.9	170	210
5	4	Kevin	5.8	175	
6	5	Amanda	5.5	145	
7	6	Carl	6.1	210	
8	7	Ned	6	180	

B) MATCH() Function :

	A	B	C	D	F	G
1		1	2	3	Match	
2	1	name	Height	Weight		
3	2	Sally	6.2	185	7	Exact match
4	3	Tom	5.9	170	1	Greater Value
5	4	Kevin	5.8	175		
6	5	Amanda	5.5	145	4	Lesser Value
7	6	Carl	6.1	210		
8	7	Ned	6	220		

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05 Demonstrate INDEX, MATCH, UNIQUE, COUNTIFS, SUMIFS, AVERAGEIFS.

A) INDEX() Function :

The INDEX() function returns a value or the reference to a value from within a table or range.

Syntax : =INDEX(array, row_num, [column_num])

Example : =INDEX(B2:D8, 4, 2)
=INDEX(B2:D8, 6, 3)

B) MATCH() Function :

The MATCH() function searches for a specified item in a range of cells, and then returns the relative position of that item in the range.

Syntax : =MATCH(lookup_value, lookup_array, [match_type])

Example : =MATCH(B8, B2:B8, 0)
=MATCH(175, D3:D8, -1)
=MATCH(180, D3:D8, 1)

C) UNIQUE() Function :

The UNIQUE() function in Excel returns a list of unique values from a range or array.

Horizon

Teacher's Signature

C) UNIQUE() Function :

	A	B	G
1		1	4
2	1	name	unique
3	2	Sally	Sally
4	3	tom	tom
5	4	Kevin	Kevin
6	5	Amanda	Amanda
7	6	Carl	Carl
8	7	ned	ned
9	8	Kevin	
10	9	Amanda	
11	10	Carl	
12	11	tom	
13	12	Sally	
14	13	ned	
15	14	Carl	

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Syntax : =UNIQUE(array, [by_col], [exactly_once])

Example : =UNIQUE(B3:B15)

D) COUNTIFS() Function :

The COUNTIFS() Function is a premade function in Excel, which counts cells in a range based on one or more true or false condition.

Syntax : =COUNTIFS(criteria_range1, Criteria1, [criteria_range2, criteria2],...)

Example : =COUNTIFS(B3:B15, "Carl", C3:C15, "=5", D3:D15, ">100")

Horizon

Teacher's Signature

D) COUNTIFS() function :

	A	B	C	D	F
1		1	2	3	
2	1	name	height	Weight	Countifs
3	2	Sally	6.2	185	
4	3	tom	5.9	170	2
5	4	Kevin	5.8	175	
6	5	Amanda	5.5	145	
7	6	Carl	6.1	210	
8	7	ned	6	220	
9	8	Kevin	5.8	175	
10	9	Amanda	6	180	
11	10	Carl	5	165	
12	11	tom	5.1	145	
13	12	Sally	5.3	150	
14	13	ned	5	190	
15	14	Carl	5	110	

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E) SUMIFS() Function :

The SUMIFS() Function, adds all of its arguments that meet multiple criteria.

Syntax : =SUMIFS(sum_range, criteria_range1, criteria1, [criteria_range2, criteria2], ...)

Example : =SUMIFS(D3:D15, B3:B15, "Carl", C3:C15, "=5")

Horizon

Teacher's Signature

E) SUMIFS()

F) AVERAGEIFS()

▲	A	B	C	D	E	F
1		1	2	3		
2	1	name	height	weight	Sumifs	Averageifs
3	2	Sally	6.2	185		
4	3	tom	5.9	170	275	161.6667
5	4	Kevin	5.8	175		
6	5	Amanda	5.5	145		
7	6	Carl	6.1	210		
8	7	ned	6	220		
9	8	Kevin	5.8	175		
10	9	Amanda	6	180		
11	10	Carl	5	165		
12	11	tom	5.1	145		
13	12	Sally	5.3	150		
14	13	ned	5	190		
15	14	Carl	5	110		

Date

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F) AVERAGEIFS() Function :

The averageifs function, which calculates the average of a range based on one or more true or false condition.

Syntax : =AVERAGEIFS(average_range, criteria_range1, criteria1, ...)

Example : =AVERAGEIFS(D3:D15, B3:B15, "Carl", D3:D15, ">0")

Horizon

Teacher's Signature

1. Probability

a. Calculating the simple probabilities.

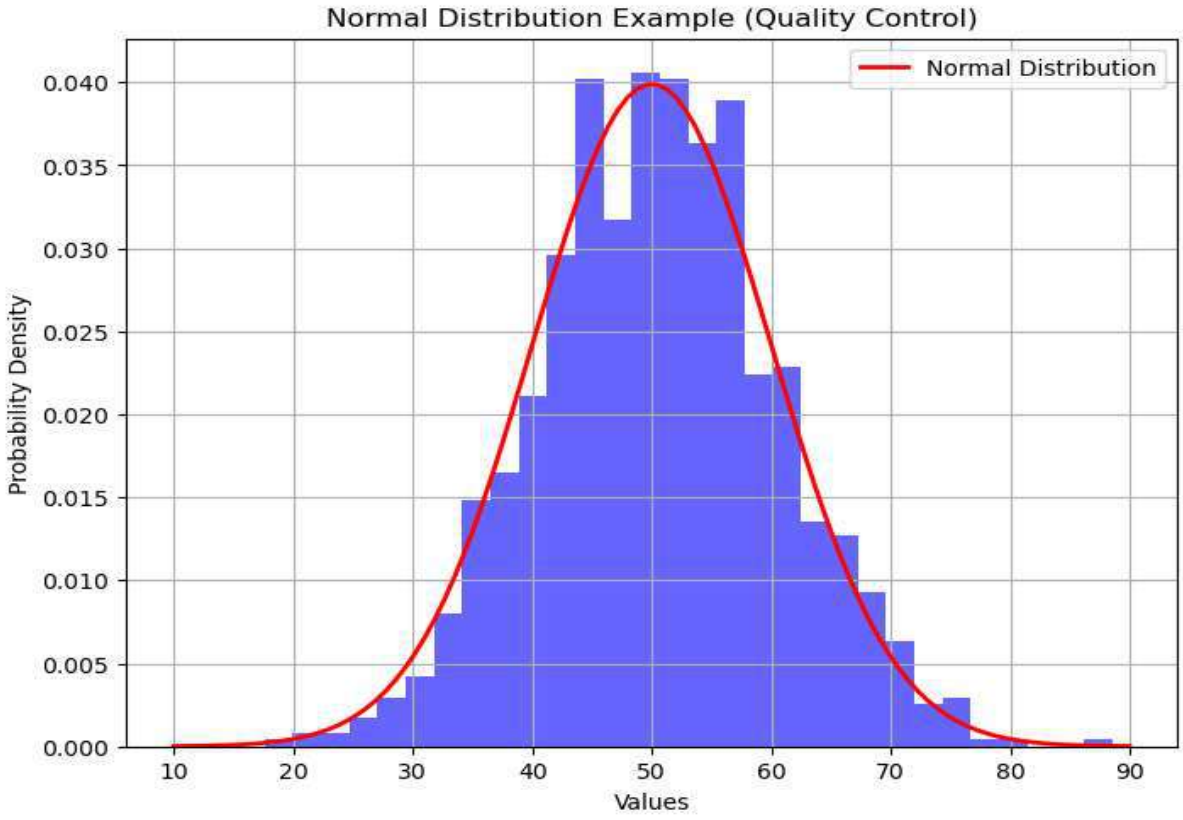
b. Applications of Probability distributions to real life problems.

```
# Simple probability
# Probability of rolling a 4 on a six-sided die
total_outcomes = 6
favorable_outcomes = 1  # Rolling a 4
probability_4 = favorable_outcomes / total_outcomes
print(f"Probability of rolling a 4: {probability_4}")

import numpy as np
import matplotlib.pyplot as plt
from scipy.stats import norm, poisson, binom, expon
# Normal Distribution - Quality Control example
# Generating and plotting a normal distribution
mean = 50
std_dev = 10
samples = np.random.normal(mean, std_dev, 1000)
plt.figure(figsize=(8, 6))
plt.hist(samples, bins=30, density=True, alpha=0.6, color='blue')
x = np.linspace(mean - 4*std_dev, mean + 4*std_dev, 100)
plt.plot(x, norm.pdf(x, mean, std_dev), 'r-', lw=2, label='Normal Distribution')
plt.title('Normal Distribution Example (Quality Control)')
plt.xlabel('Values')
plt.ylabel('Probability Density')
plt.legend()
plt.grid(True)
plt.show()

# Poisson Distribution - Service and Arrival Rates example
# Calculating the probability of a certain number of events occurring in a time frame
lambda_param = 5  # Arrival rate per hour
k = 3  # Number of events
prob_3_events = poisson.pmf(k, lambda_param)
print(f"Probability of 3 events occurring in an hour: {prob_3_events}")

# Binomial Distribution - Decision Making example
# Estimating probability of success or failure in fixed number of trials
n = 10  # Number of trials
p = 0.6  # Probability of success
k_success = 7  # Number of successes
prob_7_success = binom.pmf(k_success, n, p)
print(f"Probability of 7 successes out of 10 trials: {prob_7_success}")
```

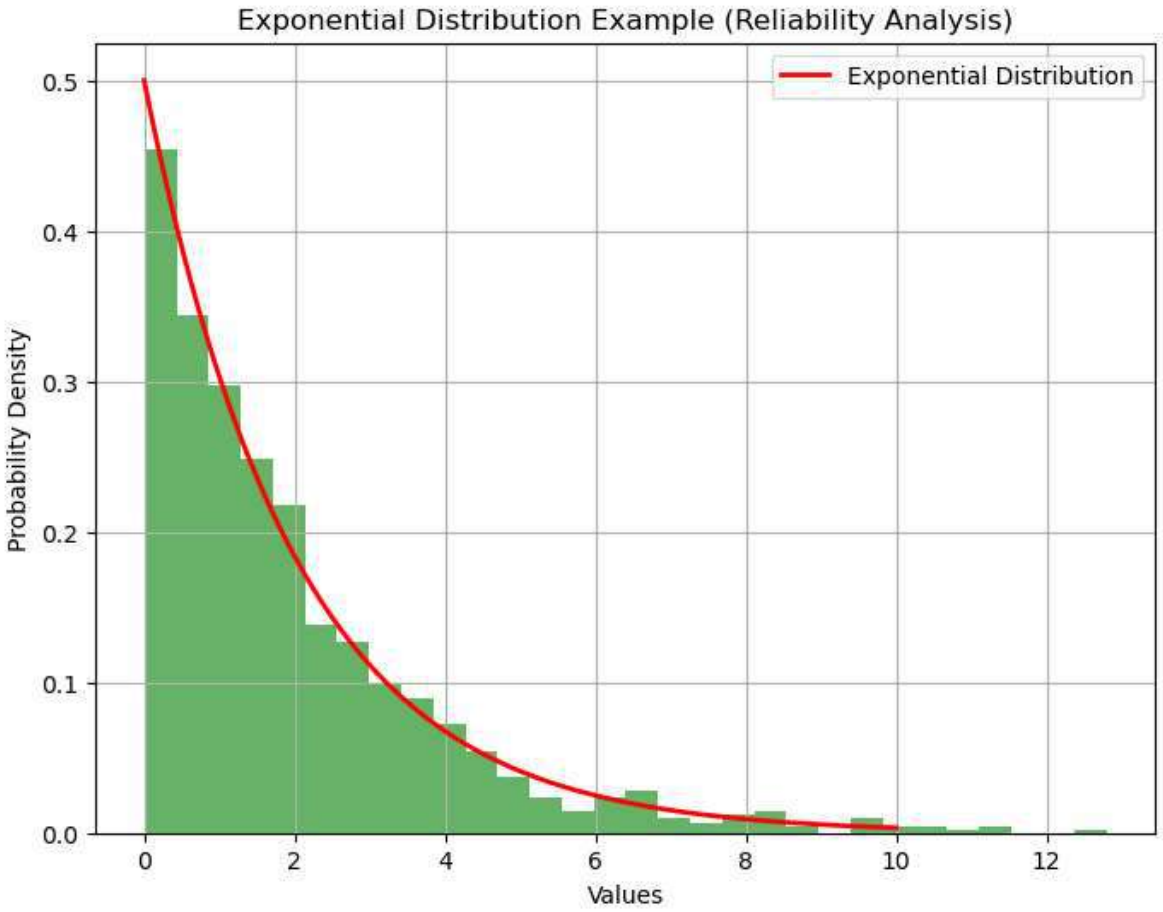
```
# Exponential Distribution - Reliability Analysis example
# Simulating and plotting an exponential distribution
exp_samples = np.random.exponential(scale=2, size=1000)
plt.figure(figsize=(8, 6))
plt.hist(exp_samples, bins=30, density=True, alpha=0.6, color='green')
x_exp = np.linspace(0, 10, 100)
plt.plot(x_exp, expon.pdf(x_exp, scale=2), 'r-', lw=2, label='Exponential
Distribution')
plt.title('Exponential Distribution Example (Reliability Analysis)')
plt.xlabel('Values')
plt.ylabel('Probability Density')
plt.legend()
plt.grid(True)
plt.show()
```

OUTPUT

```
Probability of rolling a 4: 0.16666666666666666
```




```
Probability of 3 events occurring in an hour: 0.1403738958142805
Probability of 7 successes out of 10 trials: 0.21499084799999976
```



2. Test of Significance

a. T-Test: one sample, two independent samples and paired

b. ANOVA & Chi-Square Test.

```
import pandas as pd
from scipy import stats
# Load Titanic dataset
titanic_data = pd.read_csv('train.csv')  # Replace 'train.csv' with your dataset file
# One Sample T-Test: Checking mean age against a hypothetical mean
hypothetical_mean_age = 30
ttest_one_sample = stats.ttest_1samp(titanic_data['Age'].dropna(),
hypothetical_mean_age)
print("One Sample T-Test:")
print("T-statistic:", ttest_one_sample.statistic)
print("p-value:", ttest_one_sample.pvalue)
```

```
# Two Independent Samples T-Test: Comparing ages of male and female passengers
male_ages = titanic_data[titanic_data['Sex'] == 'male']['Age'].dropna()
female_ages = titanic_data[titanic_data['Sex'] == 'female']['Age'].dropna()
ttest_two_ind_samples = stats.ttest_ind(male_ages, female_ages)
print("\nTwo Independent Samples T-Test:")
print("T-statistic:", ttest_two_ind_samples.statistic)
print("p-value:", ttest_two_ind_samples.pvalue)
# Paired T-Test: Comparing fares before and after
before_fares = titanic_data['Fare'].dropna()
after_fares = before_fares * 1.2  # Assuming a 20% increase in fares
ttest_paired = stats.ttest_rel(before_fares, after_fares)
print("\nPaired T-Test:")
print("T-statistic:", ttest_paired.statistic)
print("p-value:", ttest_paired.pvalue)
# ANOVA Test: Impact of passenger class on fares
anova_result = stats.f_oneway(titanic_data[titanic_data['Pclass'] == 1]['Fare'].dropna(),
                              titanic_data[titanic_data['Pclass'] == 2]['Fare'].dropna(),
                              titanic_data[titanic_data['Pclass'] == 3]['Fare'].dropna())
print("\nANOVA Test Result:")
print("F-statistic:", anova_result.statistic)
print("p-value:", anova_result.pvalue)
# Chi-Square Test: Relationship between survival status and passenger class
chi2_table = pd.crosstab(titanic_data['Survived'], titanic_data['Pclass'])
chi2_result = stats.chi2_contingency(chi2_table)
print("\nChi-Square Test Result:")
print("Chi-Square statistic:", chi2_result[0])
print("p-value:", chi2_result[1])
```

OUTPUT

```
One Sample T-Test:

T-statistic: -0.5534583115970276
p-value: 0.5801231230388639

Two Independent Samples T-Test:
T-statistic: 2.499206354920835
p-value: 0.012671296797013709

Paired T-Test:
T-statistic: -19.344277455944212
p-value: 7.255925461999273e-70

ANOVA Test Result:
F-statistic: 242.34415651744814
p-value: 1.0313763209141171e-84

Chi-Square Test Result:
Chi-Square statistic: 102.88898875696056
p-value: 4.549251711298793e-23
```

1. **Introduction to PowerBI-Get Started with PowerBI-Sign up for PowerBI-Overview:PowerBI data sources-Connect-to-a-SaaS solution-Uploada local CSV file-Connect to Excel data that can be refreshed-Create a Report withVisualizations**

Introduction to PowerBI

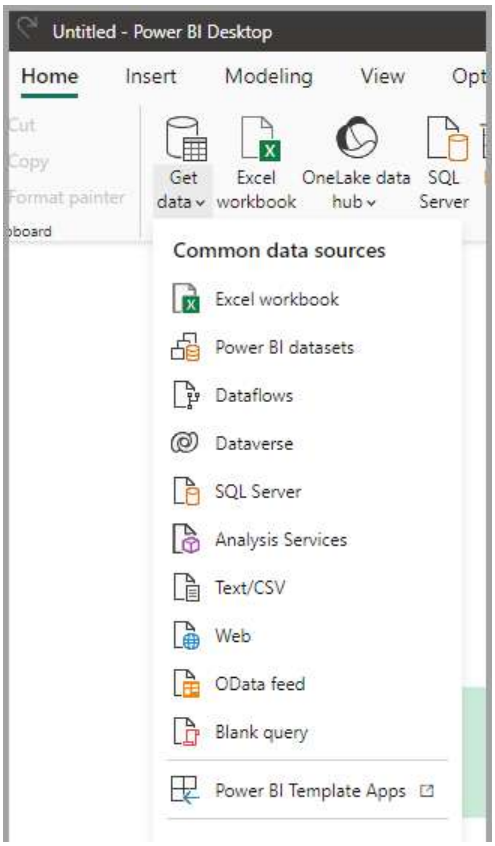
Power BI is a Data Visualization and Business Intelligence tool that converts data from different data sources to interactive dashboards and BI reports. Power BI suite provides multiple software, connector, and services - Power BI desktop, Power BI service based on Saas, and mobile Power BI apps available for different platforms. These set of services are used by business users to consume data and build BI reports.

Connect-to-a-SaaS solution

Power BI desktop app is used to create reports, while Power BI Services (Software as a Service -SaaS) is used to publish the reports, and Power BI mobile app is used to view the reports and dashboards.Power BI Desktop is available in both 32-bit and 64-bit versions.

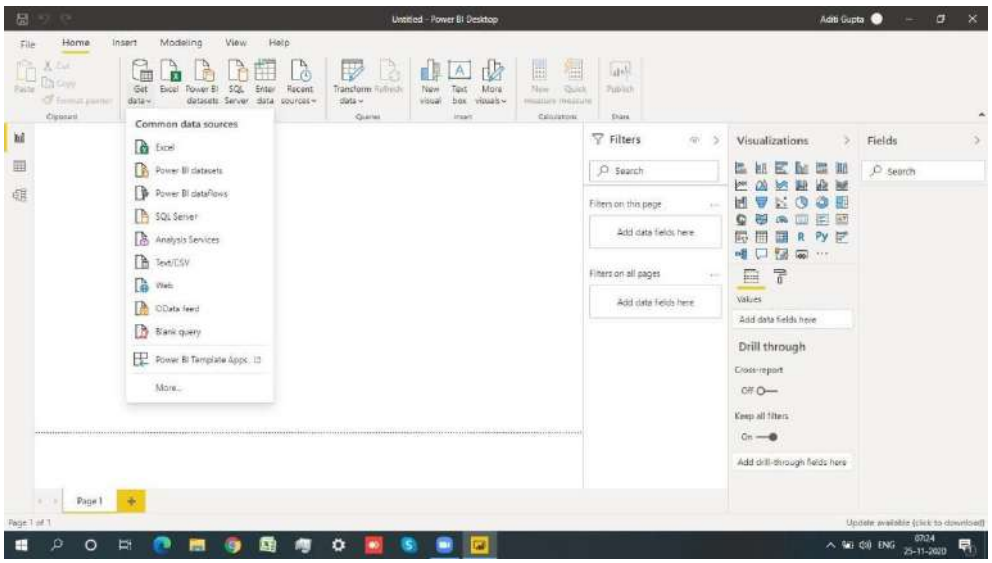
Power BI data sources:

To see available data sources, in the **Home** group of the Power BI Desktop ribbon, select the **Get data** button label or down arrow to open the **Common data sources** list. If the data source you want isn't listed under **Common data sources**, select **More** to open the **Get Data** dialog box.

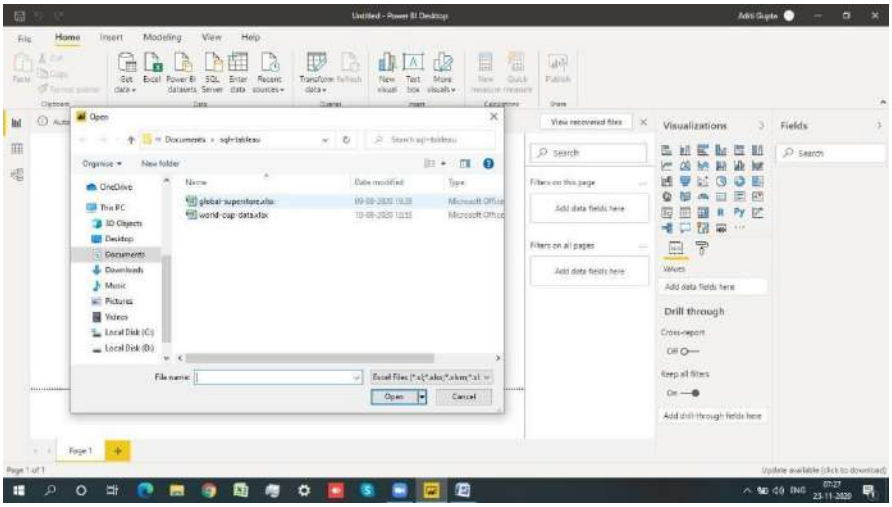


Connect to Excel data

Click on Get data -> Choose File



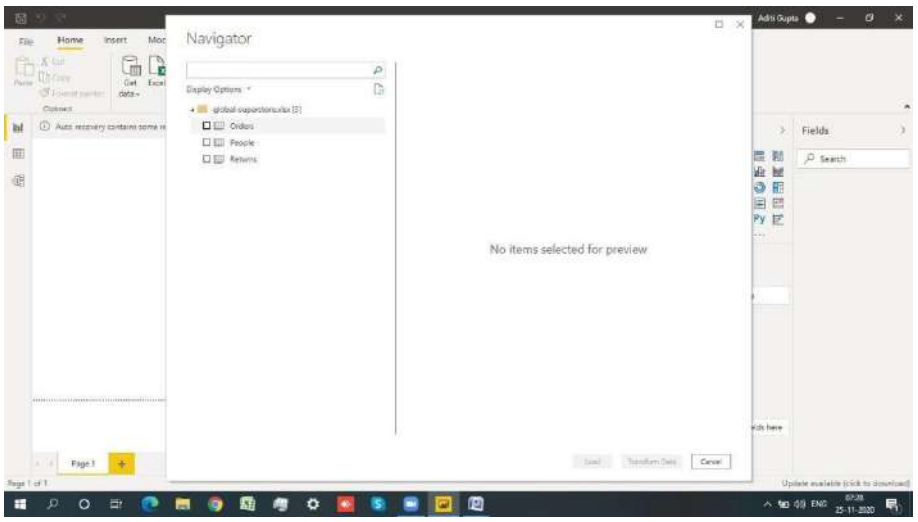
Select The Appropriate sheet



Click On Load or Transform Data

Load – Click on Load If the data is perfect, no change required or no calculated field required on the topof data.

Transform Data – If the data is incomplete you want to add some column or remove any field, basicallyfor the formatting of data click on transform data and apply the changes you need then click on close &apply.



It will load automatically and visible in the fields section.