

Experiment No: 1a

Create an Excel worksheet – A simple spreadsheet for Students' Mark Report

Aim:

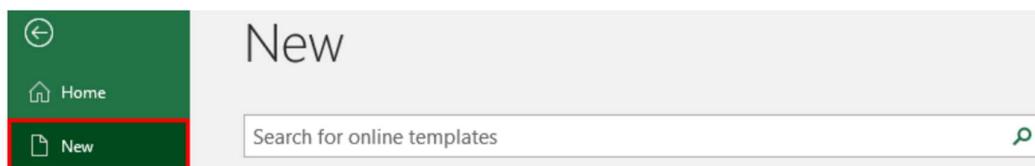
To create a simple dataset on Student Details using Excel Worksheet.

Procedure:

Step 1: Open MS Excel from the Start Menu and click on the Excel app section.



Step 2: Go to the Menu Bar in Excel and select New; click on the ‘Blank workbook’ to create a new and simple spreadsheet.



OR –Simply press the Ctrl + N button to create a new spreadsheet.

Step 3: Now, it will create Sheet 1.

Step 4: Fill the data in an organized way with columns as follows : S.No, Roll.Number, Name, Class , Section, Subject1, Subject2, Subject3, Subject4,Subject5 and give the details of all students.

Step 5: Use Drag and Fill to duplicate the data in the column Section with value 'A' and column Class = “HSC. By using Drag and Fill we can duplicate data, linearly increment data, and copy the formulas to the cells in the specified range.

	A	B	C	D	E	F	G	H	I	J
1										
2	S.NO	ROLL NUMBER	NAME	CLASS	SECTION	SUBJECT 1	SUBJECT 2	SUBJECT 3	SUBJECT 4	SUBJECT 5
3	1	123	Aswath	HSC	A	98	92	85	92	85
4	2	456	Sita	HSC	A	97	99	80	99	80
5	3	789	Amritha	HSC	A	85	100	76	100	76
6	4	101	Hemanth	HSC	A	80	89	92	85	85
7	5	111	Iakshana	HSC	A	76	85	99	80	80
8	6	134	Balaji	HSC	A	89	76	54	45	55
9	7	657	Varshni	HSC	A	92	98	100	76	76
10	8	897	Sneha	HSC	A	99	97	98	89	89
11	9	877	Shiva	HSC	A	100	85	97	85	85
12	10	543	Karthi	HSC	A	89	80	89	98	98
13	11	438	Madhu	HSC	A	85	76	85	97	97
14	12	543	Arul	HSC	A	97	99	80	99	80
15	13	243	Lakshith	HSC	A	85	100	76	100	76
16	14	875	Uma	HSC	A	80	89	92	85	85
17	15	234	David	HSC	A	76	85	99	80	80

Step 6: Use font group to change the Font Style, Add colour and Fill cell's colour, add borders etc.

Step 7: Use Alignment group to align the data present inside the workbook.

Step 8: Now use SUM(), To calculate the total marks obtained by all students.

Formula : =SUM(f1:j1)

	A	B	C	D	E	F	G	H	I	J	K
1	S.NO	ROLL NUMBER	NAME	CLASS	SECTION	SUBJECT 1	SUBJECT 2	SUBJECT 3	SUBJECT 4	SUBJECT 5	TOTAL
3	1	123	Aswath	HSC	A	98	92	85	92	85	452
4	2	456	Sita	HSC	A	97	99	80	99	80	455
5	3	789	Amritha	HSC	A	85	100	76	100	76	437
6	4	101	Hemanth	HSC	A	80	89	92	85	85	431
7	5	111	Iakshana	HSC	A	76	85	99	80	80	420
8	6	134	Balaji	HSC	A	89	76	54	45	55	319
9	7	657	Varshni	HSC	A	92	98	100	76	76	442
10	8	897	Sneha	HSC	A	99	97	98	89	89	472
11	9	877	Shiva	HSC	A	100	85	97	85	85	452
12	10	543	Karthi	HSC	A	89	80	89	98	98	454
13	11	438	Madhu	HSC	A	85	76	85	97	97	440
14	12	543	Arul	HSC	A	97	99	80	99	80	455
15	13	243	Lakshith	HSC	A	85	100	76	100	76	437
16	14	875	Uma	HSC	A	80	89	92	85	85	431
17	15	234	David	HSC	A	76	85	99	80	80	420

Step 6: Now use AVERAGE(), To calculate the percentage of all students.

Formula : =AVERAGE(Range)

	A	B	C	D	E	F	G	H	I	J	K	L
1	S.NO	ROLL NUMBER	NAME	CLASS	SECTION	SUBJECT 1	SUBJECT 2	SUBJECT 3	SUBJECT 4	SUBJECT 5	TOTAL	AVERAGE
3	1	123	Aswath	HSC	A	98	92	85	92	85	452	90.4
4	2	456	Sita	HSC	A	97	99	80	99	80	455	91
5	3	789	Amritha	HSC	A	85	100	76	100	76	437	87.4
6	4	101	Hemanth	HSC	A	80	89	92	85	85	431	86.2
7	5	111	Iakshana	HSC	A	76	85	99	80	80	420	84
8	6	134	Balaji	HSC	A	89	76	54	45	55	319	63.8
9	7	657	Varshni	HSC	A	92	98	100	76	76	442	88.4
10	8	897	Sneha	HSC	A	99	97	98	89	89	472	94.4
11	9	877	Shiva	HSC	A	100	85	97	85	85	452	90.4
12	10	543	Karthi	HSC	A	89	80	89	98	98	454	90.8
13	11	438	Madhu	HSC	A	85	76	85	97	97	440	88
14	12	543	Arul	HSC	A	97	99	80	99	80	455	91
15	13	243	Lakshith	HSC	A	85	100	76	100	76	437	87.4
16	14	875	Uma	HSC	A	80	89	92	85	85	431	86.2
17	15	234	David	HSC	A	76	85	99	80	80	420	84

Step 7: Use MAX() to find the highest mark obtained.

Formula : = MAX(range)

	A	B	C	D	E	F	G	H	I	J	K
1	S.NO	ROLL NUMBER	NAME	CLASS	SECTION	SUBJECT 1	SUBJECT 2	SUBJECT 3	SUBJECT 4	SUBJECT 5	TOTAL
3	1	123	Aswath	HSC	A	98	92	85	92	85	452
4	2	456	Sita	HSC	A	97	99	80	99	80	455
5	3	789	Amritha	HSC	A	85	100	76	100	76	437
6	4	101	Hemanth	HSC	A	80	89	92	85	85	431
7	5	111	Iakshana	HSC	A	76	85	99	80	80	420
8	6	134	Balaji	HSC	A	89	76	54	45	55	319
9	7	657	Varshni	HSC	A	92	98	100	76	76	442
10	8	897	Sneha	HSC	A	99	97	98	89	89	472
11	9	877	Shiva	HSC	A	100	85	97	85	85	452
12	10	543	Karthi	HSC	A	89	80	89	98	98	454
13	11	438	Madhu	HSC	A	85	76	85	97	97	440
14	12	543	Arul	HSC	A	97	99	80	99	80	455
15	13	243	Lakshith	HSC	A	85	100	76	100	76	437
16	14	875	Uma	HSC	A	80	89	92	85	85	431
17	15	234	David	HSC	A	76	85	99	80	80	420
18									Max		472
19											

Step 8: Use MIN() , to find the lowest score obtained .

Formula : =MIN(range)

	A	B	C	D	E	F	G	H	I	J	K
1	S.NO	ROLL NUMBER	NAME	CLASS	SECTION	SUBJECT 1	SUBJECT 2	SUBJECT 3	SUBJECT 4	SUBJECT 5	TOTAL
3	1	123	Aswath	HSC	A	98	92	85	92	85	452
4	2	456	Sita	HSC	A	97	99	80	99	80	455
5	3	789	Amritha	HSC	A	85	100	76	100	76	437
6	4	101	Hemanth	HSC	A	80	89	92	85	85	431
7	5	111	Iakshana	HSC	A	76	85	99	80	80	420
8	6	134	Balaji	HSC	A	89	76	54	45	55	319
9	7	657	Varshni	HSC	A	92	98	100	76	76	442
10	8	897	Sneha	HSC	A	99	97	98	89	89	472
11	9	877	Shiva	HSC	A	100	85	97	85	85	452
12	10	543	Karthi	HSC	A	89	80	89	98	98	454
13	11	438	Madhu	HSC	A	85	76	85	97	97	440
14	12	543	Arul	HSC	A	97	99	80	99	80	455
15	13	243	Lakshith	HSC	A	85	100	76	100	76	437
16	14	875	Uma	HSC	A	80	89	92	85	85	431
17	15	234	David	HSC	A	76	85	99	80	80	420
18									Max		472
19									Min		319

Output:

	A	B	C	D	E	F	G	H	I	J	K
1	S.NO	ROLL NUMBER	NAME	CLASS	SECTION	SUBJECT 1	SUBJECT 2	SUBJECT 3	SUBJECT 4	SUBJECT 5	TOTAL
3	1	123	Aswath	HSC	A	98	92	85	92	85	452
4	2	456	Sita	HSC	A	97	99	80	99	80	455
5	3	789	Amritha	HSC	A	85	100	76	100	76	437
6	4	101	Hemanth	HSC	A	80	89	92	85	85	431
7	5	111	Lakshana	HSC	A	76	85	99	80	80	420
8	6	134	Balaji	HSC	A	89	76	54	45	55	319
9	7	657	Varshni	HSC	A	92	98	100	76	76	442
10	8	897	Sneha	HSC	A	99	97	98	89	89	472
11	9	877	Shiva	HSC	A	100	85	97	85	85	452
12	10	543	Karthi	HSC	A	89	80	89	98	98	454
13	11	438	Madhu	HSC	A	85	76	85	97	97	440
14	12	543	Arul	HSC	A	97	99	80	99	80	455
15	13	243	Lakshith	HSC	A	85	100	76	100	76	437
16	14	875	Uma	HSC	A	80	89	92	85	85	431
17	15	234	David	HSC	A	76	85	99	80	80	420
18										Max	472
19										Min	319

Result:

A simple spreadsheet for Students' Mark Report is created and manipulated with drag and fill option, Font options, simple Excel functions like sum(), average(), min(), max(), count() etc.

Experiment No: 1b

AGGREGATE Function in Excel

Aim:

To use Aggregate() function on a Student Details dataset using Excel to aggregate data with multiple criteria to get specific results .

Aggregate() Function:

In Excel, Functions like **SUM**, **COUNT**, **LARGE**, and **MAX** won't function if a range contains errors.

The **AGGREGATE** function is used on different functions like **AVERAGE**, **COUNT**, **MAX**, **MIN**, **SUM**, **PRODUCT**, etc., with the option to ignore hidden rows and error values to get certain results.

The **AGGREGATE** function in Excel contains nineteen distinct functions for achieving the desired results.

Syntax:

=AGGREGATE(function_num, options, ref1, ref2, ...)

=AGGREGATE(function_num, options, array, [k])

=aggregate(
AGGREGATE(function_num, options, array, [k])
AGGREGATE(function_num, options, ref1, ...)

Function_num:

Function_num	Name of the function
1	AVERAGE
2	COUNT
3	COUNTA
4	MAX
5	MIN
6	PRODUCT
7	STEDEV.S
8	STEDEV.P
9	SUM
10	VAR.S
11	VAR.P
12	MEDIAN
13	MODE.SNGL

Function_num	Name of the function
14	LARGE
15	SMALL
16	PERCENTILE.INC
17	QUARTILE.INC
18	PERCENTILE.EXC
19	QUARTILE.EXC

Options:

Options	Behavior
0 or omitted	Ignore nested SUBTOTAL and AGGREGATE function
1	Ignore hidden rows, nested SUBTOTAL and AGGREGATE function
2	Ignore error values, nested SUBTOTAL and AGGREGATE function
3	Ignore hidden rows, error values, nested SUBTOTAL and AGGREGATE function
4	Ignore nothing
5	Ignore hidden rows
6	Ignore error values
7	Ignore hidden rows and error values

Ref1:

This argument specifies for which range you want to use the Aggregate function.

Procedure:

Step 1: Create a new worksheet.

Step 2: Create the dataset with inconsistencies in the actual data as follows :

	A	B	C	D	E	F	G	H	I	J	K		
2	S.NO	NUMBER	NAME	CLASS	SECTION	B1	JEC1	B1	SUBJECT 3	B1	JEC1	SUBJECT 3	TOTAL
3	1	123	Aswath	HSC	A	+	=	-	*	&		0	
4	2	456	Sita	HSC	A	97	99	80	99	80		455	
5	3	789	Amritha	HSC	A	85	100	76	100	76		437	
6	4	101	Hemanth	HSC	A	80	89	92	85	85		431	
7	5	111	Iakshana	HSC	A	o	u	#NAME?	k	r		#NAME?	
8	6	134	Balaji	HSC	A	89	76	54	45	55		319	
9	7	657	Varshni	HSC	A	92	98	100	76	76		442	
13	11	438	Madhu	HSC	A	85	76	85	97	97		440	
14	12	543	Arul	HSC	A	97	99	80	99	80		455	
15	13	243	Lakshith	HSC	A	85	100	76	100	76		437	
16	14	875	Uma	HSC	A	80	89	92	85	85		431	
17	15	234	David	HSC	A	76	85	99	80	80		420	

Step 3: Max() function will not work on the field Total in the range K2:K17.

K18 : =MAX(K3:K17)

	A	B	C	D	E	F	G	H	I	J	K
2	S.NO	NUMBER	NAME	CLASS	SECTION	BJEC	BJEC	SUBJECT 3	BJEC	SUBJECT	TOTAL
3	1	123	Aswath	HSC	A	+	=	-	*	&	0
4	2	456	Sita	HSC	A	97	99	80	99	80	455
5	3	789	Amritha	HSC	A	85	100	76	100	76	437
6	4	101	Hemanth	HSC	A	80	89	92	85	85	431
7	5	111	lakshana	HSC	A	o	u	#NAME?	k	r	#NAME?
8	6	134	Balaji	HSC	A	89	76	54	45	55	319
9	7	657	Varshni	HSC	A	92	98	100	76	76	442
13	11	438	Madhu	HSC	A	85	76	85	97	97	440
14	12	543	Arul	HSC	A	97	99	80	99	80	455
15	13	243	Lakshith	HSC	A	85	100	76	100	76	437
16	14	875	Uma	HSC	A	80	89	92	85	85	431
17	15	234	David	HSC	A	76	85	99	80	80	420
18									Max	#NAME?	

Step 4: Use Aggregate() function to calculate max on the cells in range k2:k17 by selecting appropriate arguments in their syntax.

Output:

K18 : =AGGREGATE(4,6,K3:K17)

	A	B	C	D	E	F	G	H	I	J	K
2	S.NO	NUMBER	NAME	CLASS	SECTION	BJEC	BJEC	SUBJECT 3	BJEC	SUBJECT	TOTAL
3	1	123	Aswath	HSC	A	+	=	-	*	&	0
4	2	456	Sita	HSC	A	97	99	80	99	80	455
5	3	789	Amritha	HSC	A	85	100	76	100	76	437
6	4	101	Hemanth	HSC	A	80	89	92	85	85	431
7	5	111	lakshana	HSC	A	o	u	#NAME?	k	r	#NAME?
8	6	134	Balaji	HSC	A	89	76	54	45	55	319
9	7	657	Varshni	HSC	A	92	98	100	76	76	442
13	11	438	Madhu	HSC	A	85	76	85	97	97	440
14	12	543	Arul	HSC	A	97	99	80	99	80	455
15	13	243	Lakshith	HSC	A	85	100	76	100	76	437
16	14	875	Uma	HSC	A	80	89	92	85	85	431
17	15	234	David	HSC	A	76	85	99	80	80	420
18									Max	455	

Result :

Thus when an appropriate option is used in the AGGREGATE function, the AGGREGATE in Excel returns or gives the MAX of the remaining values neglecting the error value in cells K2 & C17. i.e. 455.

Experiment No: 2

Working with Data: Importing data, Data Entry & Manipulation, Sorting & Filtering.

Consider the following data to create a csv file (transaction.csv) and import the Transaction.csv dataset to Excel worksheet.

Transaction ID	Date	Product	Type	Unit	Price	Total Amount
1	2023-01-01	Widget	A	100	\$2.50	\$250.00
2	2023-01-02	Widget	B	75	\$3.00	\$225.00
3	2023-01-03	Widget	A	50	\$2.50	\$125.00
4	2023-01-04	Widget	C	120	\$1.80	\$216.00
5	2023-01-05	Widget	B	90	\$3.00	\$270.00

Perform the listed data manipulation operations to the dataset using Excel.

1. Copy the imported data to a new worksheet and update the existing transaction data with three more rows.
2. Sort the data based on the "Date" column in ascending order to analyze transactions chronologically.
3. Apply filters to the "Product" column to focus on specific products.
4. Filter the data based on the "Date" column to analyze transactions on specific months.
5. Filter the data based on "Unit" to analyze the transactions above or below certain units by combining filters.

Aim:

To import the following data and perform the below listed data entry and data manipulation Operations using sorting and filtering in Excel.

Procedure:

Importing Data

Step 1: Save the above data in a CSV file as transaction.csv.

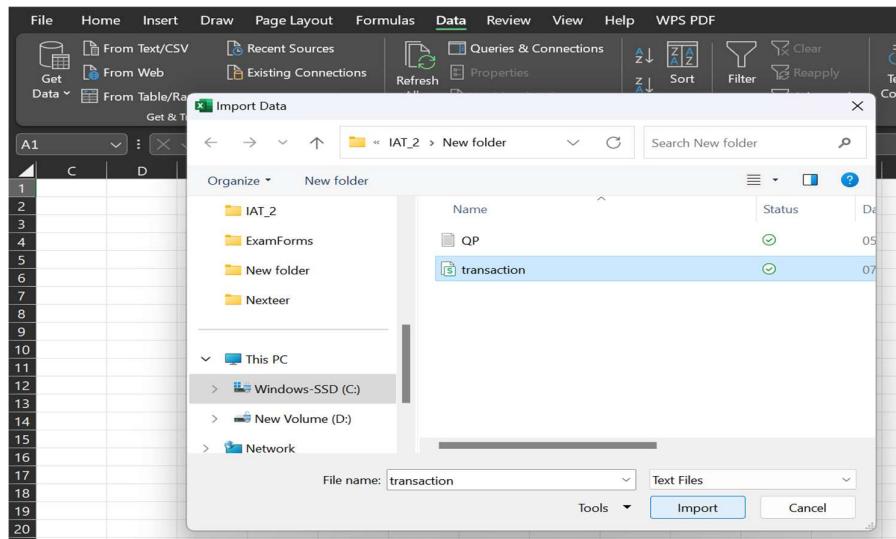
Input : transaction.csv

transaction

File Edit View

Transaction_ID	Date	Product	Type	Unit	Price	Total_Amount
1,2023-01-01	Widget,A,100,\$2.50,\$250.00					
2,2023-01-02	Widget,B,75,\$3.00,\$225.00					
3,2023-01-03	Widget,A,50,\$2.50,\$125.00					
4,2023-01-04	Widget,C,120,\$1.80,\$216.00					
5,2023-01-05	Widget,B,90,\$3.00,\$270.00					

Step 2: Open Excel and use the "Data" tab to import the CSV file into a new worksheet.



Book2 • Saved

File Home Insert Draw Page Layout Formulas Data Review View Help WPS PDF

Get & Transform Data

transaction.csv

File Origin Delimiter Data Type Detection

1252: Western European (Windows) Comma Based on first 200 rows

Transaction_ID	Date	Product	Type	Unit	Price	Total_Amount
1	01-01-2023	Widget	A	100	\$2.50	\$250.00
2	02-01-2023	Widget	B	75	\$3.00	\$225.00
3	03-01-2023	Widget	A	50	\$2.50	\$125.00
4	04-01-2023	Widget	C	120	\$1.80	\$216.00
5	05-01-2023	Widget	B	90	\$3.00	\$270.00

Load Transform Data Cancel

Output: (Data Import)

The screenshot shows a WPS Office spreadsheet application window. The ribbon bar at the top includes tabs for File, Home, Insert, Draw, Page Layout, Formulas, Data, Review, View, Help, WPS PDF, Table Design, and Query. The 'Table Design' tab is selected. A table named 'transaction' is displayed in the main area, containing the following data:

Transaction_ID	Date	Product	Type	Unit	Price	Total_Amount
1	01-01-2023	Widget	A	100	\$2.50	\$250.00
2	02-01-2023	Widget	B	75	\$3.00	\$225.00
3	03-01-2023	Widget	A	50	\$2.50	\$125.00
4	04-01-2023	Widget	C	120	\$1.80	\$216.00
5	05-01-2023	Widget	B	90	\$3.00	\$270.00

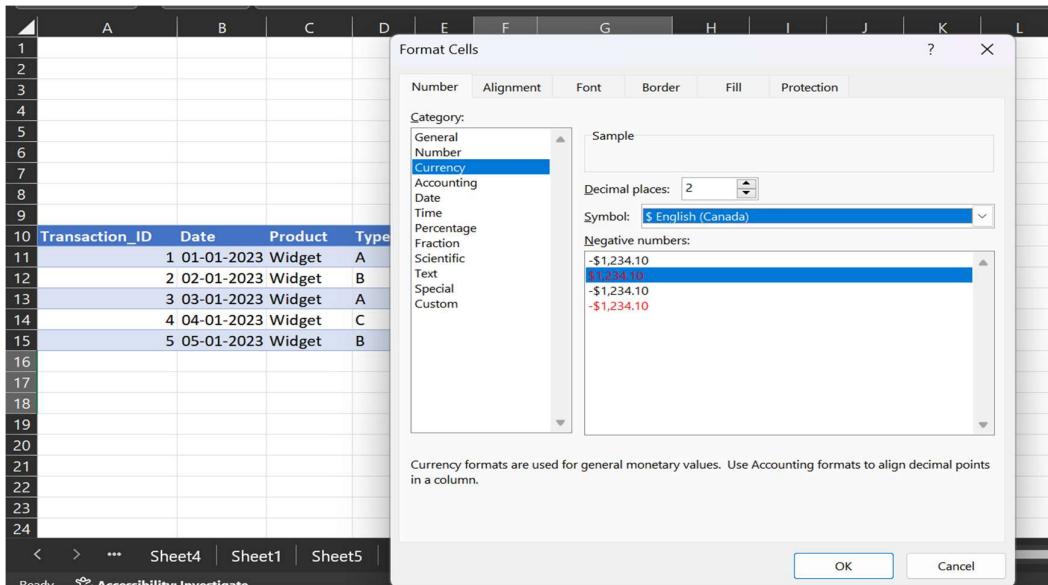
The 'Queries & Connections' sidebar on the right shows a single query named 'transaction' with 5 rows loaded.

Data Entry

Step 1: Add 3 new rows for a new transaction with quantity, units & prices for the products as needed. Format the cells Price and Total_Amount to currency by selecting the cells → Right click → Format Cells

The screenshot shows a WPS Office spreadsheet application window. A context menu is open over the last row of the table, listing the following options:

- Delete...
- Clear Contents
- Quick Analysis
- Filter >
- Sort >
- Get Data from Table/Range...
- New Comment
- New Note
- Format Cells...
- Pick From Drop-down List...



Step 2: Calculate the Total Amount based on the Type and Unit Price for each transaction using a formula Total Amount = product(units*prices)

Output: (Data Entry)

Transaction_ID	Date	Product	Type	Unit	Price	Total_Amount
1	01-01-2023	Widget	A	100	\$2.50	\$250.00
2	02-01-2023	Widget	B	75	\$3.00	\$225.00
3	03-01-2023	Widget	A	50	\$2.50	\$125.00
4	04-01-2023	Widget	C	120	\$1.80	\$216.00
5	05-01-2023	Widget	B	90	\$3.00	\$270.00
6	15-02-2023	Antivirus SVA		75	\$5.00	\$375.00
7	23-02-2023	Antivirus SVB		50	\$15.00	\$750.00
8	25-02-2023	Antivirus SVC		30	\$25.00	\$750.00

Sorting:

Step 1: Select the dataset. Goto Data Tab → Select Sort command to Sort.

Step 2: Sort the data based on the "Date" column in ascending order to analyze transactions chronologically.

Transaction_ID	Date	Product	Type	Unit	Price	Total_Amount
1	01-01-2023	Widget	A	100	\$2.50	\$250.00
2	02-01-2023	Widget	B	75	\$3.00	\$225.00
3	03-01-2023	Widget	A	50	\$2.50	\$125.00
4	04-01-2023	Widget	C	120	\$1.80	\$216.00
5	05-01-2023	Widget	B	90	\$3.00	\$270.00
6	15-02-2023	Antivirus SVA		75	\$5.00	\$375.00
7	23-02-2023	Antivirus SVB		50	\$15.00	\$750.00
8	25-02-2023	Antivirus SVC		30	\$25.00	\$750.00

Output: (Sorting)

	A	B	C	D	E	F	G
1	Transaction_ID	Date	Product	Type	Unit	Price	Total_Amount
2		1 01-01-2023	Widget	A	100	\$2.50	\$250.00
3		2 02-01-2023	Widget	B	75	\$3.00	\$225.00
4		3 03-01-2023	Widget	A	50	\$2.50	\$125.00
5		4 04-01-2023	Widget	C	120	\$1.80	\$216.00
6		5 05-01-2023	Widget	B	90	\$3.00	\$270.00
7		6 15-02-2023	Antivirus SW	A	75	\$5.00	\$375.00
8		7 23-02-2023	Antivirus SW	B	50	\$15.00	\$750.00
9		8 25-02-2023	Antivirus SW	C	30	\$25.00	\$750.00

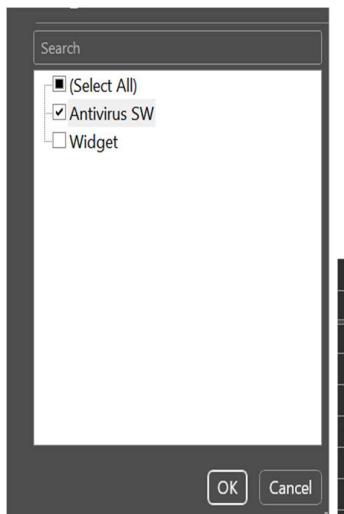
Filtering:

Step 1: Goto Data Tab → Filter command to apply filter on any column to filter out the data upon specific conditions.

	A	B	C	D	E	F	G
1	Transaction_ID	Date	Product	Type	Unit	Price	Total_Amount
2		1 01-01-2023	Widget	A	100	\$2.50	\$250.00
3		2 02-01-2023	Widget	B	75	\$3.00	\$225.00
4		3 03-01-2023	Widget	A	50	\$2.50	\$125.00
5		4 04-01-2023	Widget	C	120	\$1.80	\$216.00
6		5 05-01-2023	Widget	B	90	\$3.00	\$270.00
7		6 15-02-2023	Antivirus SW	A	75	\$5.00	\$375.00
8		7 23-02-2023	Antivirus SW	B	50	\$15.00	\$750.00
9		8 25-02-2023	Antivirus SW	C	30	\$25.00	\$750.00

Step 2: Apply filters to the "Product" column to focus on Antivirus product.

Output : (Single criteria Filtering)



	A	B	C	D	E	F	G
1	Transaction_ID	Date	Product	Type	Unit	Price	Total_Amount
7		6 15-02-2023	Antivirus SW	A	75	\$5.00	\$375.00
8		7 23-02-2023	Antivirus SW	B	50	\$15.00	\$750.00
9		8 25-02-2023	Antivirus SW	C	30	\$25.00	\$750.00

Step 3: Filter the data based on the "Date" column to analyze transactions on January.

Output : (Single Criteria Filtering)

A	B	C	D	E	F	G
1	Transaction_ID	Date	Sort Oldest to Newest	Search (All)	Amount	
2		1 01-01-2023		(Select All)	00	
3		2 02-01-2023		2023	00	
4		3 03-01-2023		January	00	
5		4 04-01-2023		01	00	
6		5 05-01-2023		02	00	
7		6 15-02-2023		03	\$375.00	
8		7 23-02-2023		04	\$750.00	
9		8 25-02-2023		05	\$750.00	
0				February		
1						
2						
3						
4						

Step 4: Filter the data based on “Unit” to analyze the transactions on units above 70 and below 100 .

Output : (Multi Criteria Filtering)

A	B	C	D	E	F	G	
1	Transaction_ID	Date	Product	Type	Unit	Price	Total_Amount
3		2 02-01-2023	Widget	B	75	\$3.00	\$225.00
6		5 05-01-2023	Widget	B	90	\$3.00	\$270.00
7		6 15-02-2023	Antivirus SW	A	75	\$5.00	\$375.00

Result:

Excel has a number of powerful options for data manipulation, and each is customizable as per the requirement. With proper steps we can manipulate any huge datasets down to only the pieces of information required that matters.

Experiment 3a

Working with Data: Data Validation, Pivot Tables & Pivot Charts.

Consider the following data:

Emp_ID	Name	Department	Performance Rating	Salary
101	John Doe	Marketing	4.5	\$60,000
102	Jane Smith	Sales	3.8	\$55,000
103	Bob Johnson	Finance	4.2	\$65,000
104	Alice Brown	IT	4.8	\$70,000
105	Chris Wilson	HR	3.5	\$50,000

Perform the following validations on the relevant data:

1. Validate the **Performance Rating** column, such that the entered values are between 1 and 5 (representing the performance rating scale).
2. Display the error/alert message on **Emp_Id** column, to ensure whether the inputting value is equal to 3 digits.
3. Apply the data validation rule to other cells.
4. Find cells with data validation in your database.
5. Highlight the cell if it contains any invalid data.

Aim:

To validate (restrict) the user input to the Excel worksheet using Data Validation feature by creating a validation rule that controls what kind of data can be entered into a certain cell.

Procedure:

1. To set up the data validation rule in the "Performance Rating" column, to ensure that the input value is between 1 and 5 (representing the performance rating scale). Perform the following steps

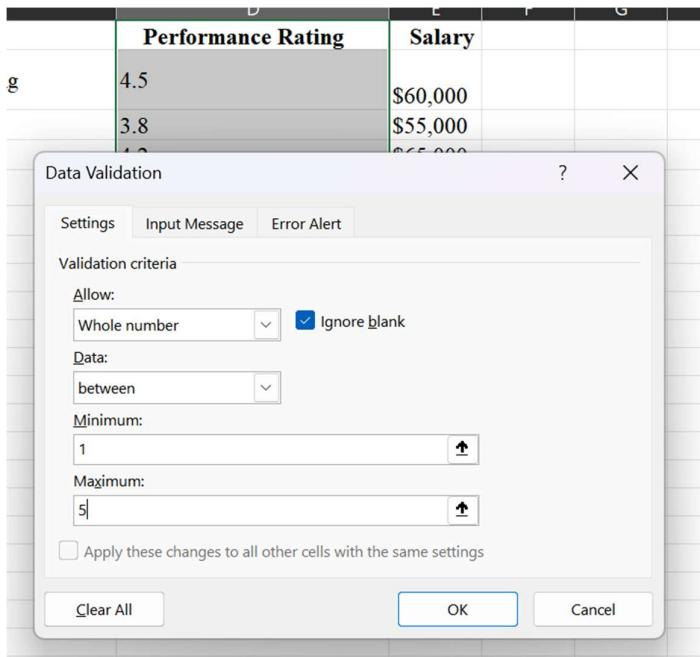
- Select the "Performance Rating" Column:
- Click on the cell in the "Performance Rating" column where you want to start the validation.
- Drag to select the entire column or the range of cells where you want to apply data validation.
- Go to the "Data" Tab:
 - Navigate to the "Data" tab in the Excel ribbon.
 - Click on "Data Validation":
In the "Data Tools" group, click on "Data Validation."

File	Home	Insert	Draw	Page Layout	Formulas	Data	Review	View	Help	WPS PDF
						From Text/CSV Get From Web From Table/Range	Recent Sources Existing Connections Refresh All Queries & Connections Properties Workbook Links	Sort Filter Clear Reapply Advanced	Text to Columns What-If Analysis Forecast Sheet	
						Get & Transform Data	Queries & Connections	Sort & Filter	Data Tools	
						D1				

Performance Rating

A	B	C	D	E	F	G	H	I	J	K
1	Emp_ID	Name	Department	Performance Rating	Salary					
2	101	John Doe	Marketing	4.5	\$60,000					
3	102	Jane Smith	Sales	3.8	\$55,000					
4	103	Bob Johnson	Finance	4.2	\$65,000					
5	104	Alice Brown	IT	4.8	\$70,000					
6	105	Chris Wilson	HR	3.5	\$50,000					

- Set Up Data Validation Criteria
 - In the "Data Validation" dialog box, go to the "Settings" tab.
 - In the "Allow" drop-down menu, choose "Whole number."
- In the "Data" section
 - Choose "between" in the drop-down menu.
 - Set the minimum value to 1 and the maximum value to 5.



- If you edit the values upon the validated cells violating the rules then the Excel will throw an error message and will not allow you to edit.

Output:

	A	B	C	D	E	F	G	H	I
1	Emp_ID	Name	Department	Performance Rating	Salary				
2	101	John Doe	Marketing	4.5	\$60,000				
3	102	Jane Smith	Sales	3.8	\$55,000				
4	103	Bob Johnson	Finance	4.2					
5	104	Alice Brown	IT	4.8					
6	105	Chris Wilson	HR	9					
7									
8									
9									
10									
11									

2. To add input message on “Emp_ID” column, “Please enter the valid 3-digit number” and also display the error/alert message if value is less than or greater than 3-digit number. Perform the following steps

- Select the "Emp_ID" Column:
 - Click on the cell in the "Emp_ID" column where you want to start the validation.
 - Drag to select the entire column or the range of cells where you want to apply data validation.
- Go to the "Data" Tab:
 - Navigate to the "Data" tab in the Excel ribbon.
 - Click on "Data Validation":
 - In the "Data Tools" group, click on "Data Validation."
- Set Up Data Validation Criteria:
 - In the "Data Validation" dialog box, go to the "Settings" tab.
 - In the "Allow" drop-down menu, choose "Whole number."
- In the "Data" section:
 - Choose "between" in the drop-down menu.
 - Set the minimum value to 100 and the maximum value to 999 (for a 3-digit number).

	A	B	C	D
1	Emp_ID	Name	Department	Performance
2	101	John Doe	Marketing	4.5
3	102	Jane Smith	Sales	3.8
4	103			
5	104			
6	105			
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

Data Validation

Validation criteria

Allow: Whole number

Data: between

Minimum: 100

Maximum: 999

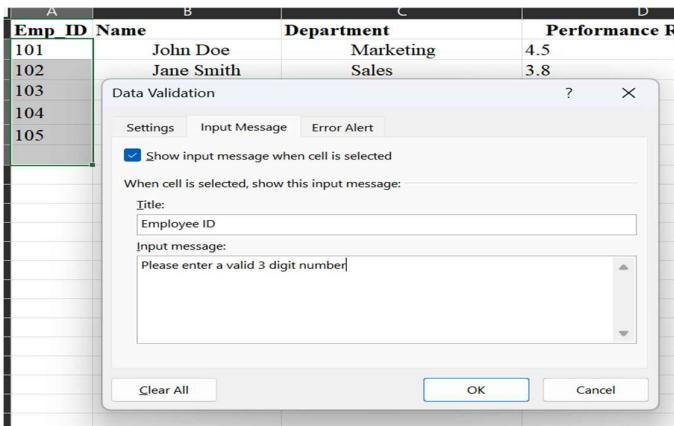
Apply these changes to all other cells with the same settings

OK Cancel

Input Message:

- Go to the "Input Message" tab in the "Data Validation" dialog box.

- Check the "Show input message when cell is selected" option.
- Enter a title (e.g., "Employee ID") and an input message (e.g., "Please enter a valid 3-digit number").



Error Alert:

- Go to the "Error Alert" tab in the "Data Validation" dialog box.
- Check the "Show error alert after invalid data is entered" option.
- Enter a title (e.g., "Invalid Employee ID") and an error message (e.g., "Please enter a valid 3-digit number").
- Choose an error style (e.g., "Stop" to prevent invalid entries).
- Click the "OK" button to apply the data validation.

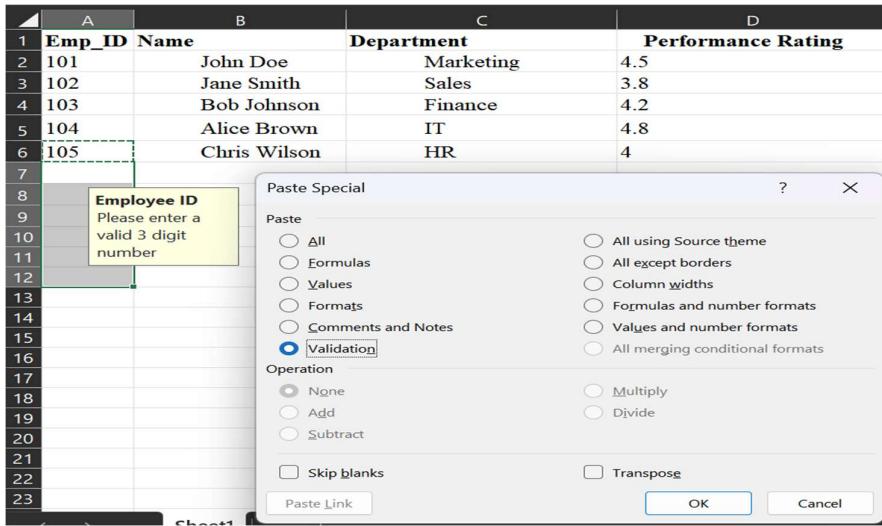
Output:

The screenshot shows an Excel spreadsheet with data in columns A, B, and C. Row 7 contains the value '1111' in cell A7. A tooltip-style dialog box titled 'Invalid Employee ID' is displayed over this cell, containing the text 'Provide the ID with 3 digit number' and a red circular close button. At the bottom of the dialog are 'Retry', 'Cancel', and 'Help' buttons. The 'Retry' button is highlighted with a blue border.

3. Copy Excel data validation rule to other cells

- Select the Cell with Data Validation:
 - Click on the cell that has the data validation rule you want to copy.
- Copy the Cell
 - Press **Ctrl + C** or right-click and choose "Copy".
 - Select the Target Cells:

- Select the range of cells where you want to apply the same data validation rule.
- Paste Special with Validation:
 - Right-click on the first cell of the selected range.
 - Choose "Paste Special" from the context menu.
 - In the "Paste Special" dialog box, select "Validation" from the options.
 - Click "OK" to apply the data validation rule to the selected cells.



Output:

The screenshot shows the same Excel spreadsheet after applying the validation rule. Cell A8 now displays an error message: "Invalid Employee ID Provide the ID with 3 digit number". An "Invalid Employee ID" dialog box is overlaid on the spreadsheet, containing the error message and three buttons: "Retry", "Cancel", and "Help". The "OK" button is highlighted.

	A	B	C	D
1	Emp_ID	Name	Department	Per
2	101	John Doe	Marketing	4.5
3	102	Jane Smith	Sales	3.8
4	103	Bob Johnson	Finance	4.2
5	104	Alice Brown	IT	4.8
6	105	Chris Wilson	HR	4
7	111			
8	7777			

4. To Find cells with data validation in your database. Perform the following steps

- Select the Range:
 - Select the range or the entire worksheet where you want to find cells with data validation.
 - Open "Go To Special" Dialog:
Press Ctrl + G to open the "Go To" dialog box.
- Alternatively, you can go to the "Home" tab, click on "Find & Select" in the "Editing" group, and choose "Go To Special."
 - Choose "Data Validation":

- In the "Go To Special" dialog box, select "Data Validation."
- Click "OK"
- Click the "OK" button.

A	B	C	D	E	
1	Emp_ID	Name	Department	Performance Rating	Salary
2	101	John Doe	Marketing	4.5	\$60,000
3	102	Employee ID	Sales	3.8	\$55,000
4	103	Please enter a valid 3 digit number	Finance	4.2	\$65,000
5	104	Johnson	IT	4.8	\$70,000
6	105	Smith	HR	4	\$50,000
7	111	Wilson			
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					

Output:

A	B	C	D	E	F
1	Emp_ID	Name	Department	Performance Rating	Salary
2	101	John Doe	Marketing	4.5	\$60,000
3	102	Employee ID	Sales	3.8	\$55,000
4	103	Please enter a valid 3 digit number	Finance	4.2	\$65,000
5	104	Johnson	IT	4.8	\$70,000
6	105	Smith	HR	4	\$50,000
7	111	Wilson			
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

5. Highlight the invalid data.

- Microsoft Excel allows applying data validation to cells that already have data in them, but it will not notify if some of the existing values do not meet the validation criteria.
- To find invalid data that had made its way into your worksheets before you added data validation
- Go to the *Data* tab, and click *Data Validation > Circle Invalid Data*

Output:

The screenshot shows a Microsoft Excel spreadsheet with the following data:

D	E
Performance Rating	Salary
4.5	\$60,000
3	\$55,000
8	\$65,000
4.8	\$70,000
4	\$50,000

A context menu is open over the range D1:E5, specifically over the row containing '8'. The menu includes options: Data Validation..., Circle Invalid Data, and Clear Validation Circles. Red circles highlight rows 1, 2, 3, and 5, while a green circle highlights row 4.

Result:

The Data validation feature is practiced for checking the integrity, accuracy and format of data before it can be used for any analytics operation.