

VLOOKUP, Match & Index

- The **VLOOKUP** (Vertical Lookup) function is used to search for a value in the **first column** of a table or range and return a value from another column in the same row.
- It's very useful for looking up and retrieving data from large tables based on a specific key.

```
=VLOOKUP(lookup_value, table_array, col_index_num, [range_lookup])
```

- **lookup_value** → The value to search for.
- **table_array** → The range of data (first column must contain `lookup_value`).
- **col_index_num** → The column number (starting from 1) from which to return the value.
- **range_lookup** → (Optional)
 - `TRUE` (1) → Approximate match (default).
 - `FALSE` (0) → Exact match.

A	B	C	D	E	F
Employee ID	Name	Department	Salary	Joining Date	emp_type
EMP001	Employee_1	Finance	₹ 41,954.00	1/1/2020	Grade5
EMP002	Employee_2	Operations	₹ 49,855.00	1/2/2020	Grade4
EMP003	Employee_3	Sales	₹ 94,210.00	1/3/2020	Grade1
EMP004	Employee_4	Finance	₹ 74,689.00	1/4/2020	Grade3
EMP005	Employee_5	Operations	₹ 90,652.00	1/5/2020	Grade1
EMP006	Employee_3	Operations	₹ 74,820.00	1/6/2020	Grade3
EMP007	Employee_7	Sales	₹ 85,206.00	1/7/2020	Grade2
EMP008	Employee_8	Finance	₹ 30,924.00	1/8/2020	Grade5
EMP009	Employee_9	Operations	₹ 57,737.00	1/9/2020	Grade4
EMP010	Employee_10	Sales	₹ 36,000.00	1/10/2020	Grade5
EMP011	Employee_11	Sales	₹ 96,371.00	1/11/2020	Grade1
EMP012	Employee_12	Operations	₹ 85,028.00	1/12/2020	Grade2

Employee ID	emp005
Name	=VLOOKUP(\$H\$2,\$A\$1:\$E\$13,ROW()-1,0)
Department	Operations
Salary	90652
Joining Date	1/5/2020

- **\$** Fixes the value & table
- **ROW()-1** → This returns the row number
 - **-1** → Because we are in Row 3.. we want the column index from 2
- When we drag this formula, it will update the contents in the row
- **0** → **Exact Match**



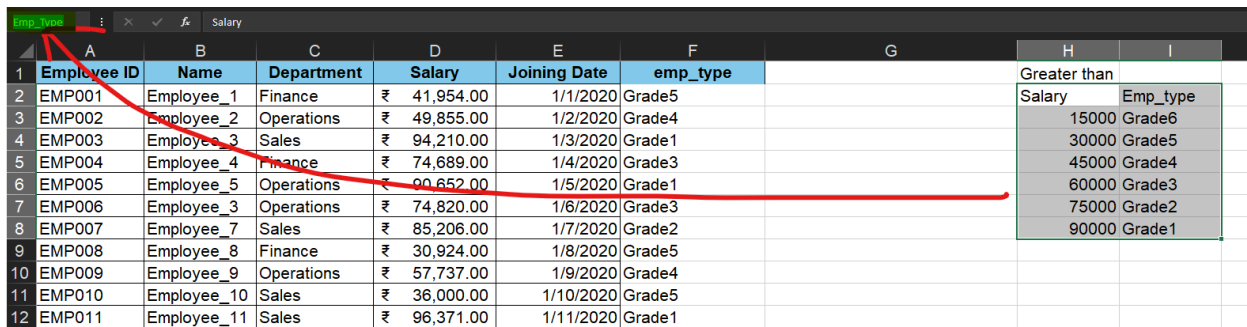
For Exact Match, no need to sort the table in Ascending order.

Task:

- We want to grade employees according to their salaries

Greater than	
Salary	Emp_type
15000	Grade6
30000	Grade5
45000	Grade4
60000	Grade3
75000	Grade2
90000	Grade1

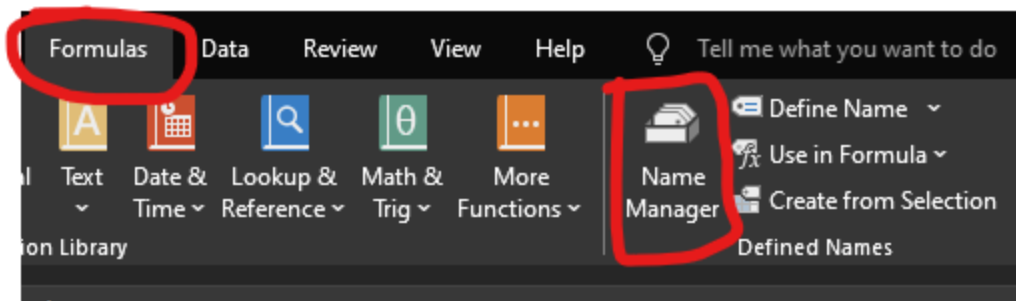
- First select this table and name it



Employee ID	Name	Department	Salary	Joining Date	emp_type
EMP001	Employee_1	Finance	₹ 41,954.00	1/1/2020	Grade5
EMP002	Employee_2	Operations	₹ 49,855.00	1/2/2020	Grade4
EMP003	Employee_3	Sales	₹ 94,210.00	1/3/2020	Grade1
EMP004	Employee_4	Finance	₹ 74,689.00	1/4/2020	Grade3
EMP005	Employee_5	Operations	₹ 90,652.00	1/5/2020	Grade1
EMP006	Employee_3	Operations	₹ 74,820.00	1/6/2020	Grade3
EMP007	Employee_7	Sales	₹ 85,206.00	1/7/2020	Grade2
EMP008	Employee_8	Finance	₹ 30,924.00	1/8/2020	Grade5
EMP009	Employee_9	Operations	₹ 57,737.00	1/9/2020	Grade4
EMP010	Employee_10	Sales	₹ 36,000.00	1/10/2020	Grade5
EMP011	Employee_11	Sales	₹ 96,371.00	1/11/2020	Grade1

Greater than	
Salary	Emp_type
15000	Grade6
30000	Grade5
45000	Grade4
60000	Grade3
75000	Grade2
90000	Grade1

- We named it **Emp_Type**
- To edit the name of the table:
 - Formulas Tab → Name Manager



Name Manager

New... Edit... Delete Filter

Name	Value	Refers To	Scope	Comment
Emp_Type	{"Salary","Emp_type..."}	=V-Lookup (2)!\$H...	Workbo...	



In the above example, we are using **Approximate Match**. Therefore, the data should be **SORTED in Ascending order**..

=VLOOKUP(D2,Emp_Type,2,1)

Salary	Emp_type
15000	Grade6
30000	Grade5
45000	Grade4
60000	Grade3
75000	Grade2
90000	Grade1

Handwritten red box around the data table with a red arrow pointing to the 'Emp_type' column and the number '2'.

- 1 → Approximate Match

MATCH

- In Excel, the **MATCH** function is used to search for a value within a range and return its relative position.
- It's very helpful when you need to find the position of a value in a row or column.

```
=MATCH(lookup_value, lookup_array, [match_type])
```

1. **lookup_value**: The value you want to match (can be number, text, logical value, or cell reference)
2. **lookup_array**: The range of cells being searched.



!! Only select a 1D array

3. **[match_type]**: Optional - specifies how Excel matches the lookup_value
 - 1 or omitted: Finds largest value \leq lookup_value (requires sorted ascending)
 - 0: Finds exact match (doesn't require sorting)
 - -1: Finds smallest value \geq lookup_value (requires sorted descending)

Key Features

- Returns the position (row number) of the matched item, not the value itself
- Case-insensitive when matching text
- Wildcards can be used with text matches (? for single character, * for any sequence)

- Returns **#N/A** if no match is found

INDEX

- The **INDEX** function in Excel returns a value from a specific position in a range or array.
- It is often combined with **MATCH** to create flexible and powerful lookup formulas (as an alternative to **VLOOKUP** or **HLOOKUP**).

1. Array Form (Most Common)

Returns a value from a single row and column in a given range.

Syntax:

INDEX(array, row_num, [column_num])

- **array** : The range of cells or an array constant from which to return a value.
- **row_num** : The row number in the array from which to return a value.
- **[column_num]** : Optional. The column number in the array from which to return a value. If omitted, Excel assumes the first column in the array.

	A	B	C	D	
1	Class/Subjects	8:00 AM - 8:45 AM	8:45 AM - 9:30 AM	9:30 AM - 10:15 AM	
2	Mathematics	Mathematics (Ms. Johnson)	Mathematics (Mr. Smith)	Mathematics (Mrs. Lee)	Mathe
3	Science	Science (Mr. Smith)	Science (Mrs. Lee)	Science (Mr. Brown)	Scienc
4	English	English (Mrs. Lee)	English (Mr. Brown)	English (Ms. Davis)	Englis
5	History	History (Mr. Brown)	History (Ms. Davis)	History (Mr. Wilson)	Histor
6	Geography	Geography (Ms. Davis)	Geography (Mr. Wilson)	Geography (Ms. Taylor)	Geogr
7	Physical Education	Physical Education (Mr. Wilson)	Physical Education (Ms. Taylor)	Physical Education (Mr. White)	Physic
8	Art	Art (Ms. Taylor)	Art (Mr. White)	Art (Ms. Johnson)	Art (Mi
9	Computer Science	Computer Science (Mr. White)	Computer Science (Ms. Johnson)	Computer Science (Mr. Smith)	Comp
10					
11					
12			Science (Mrs. Lee)		
13					

2. Reference Form

Returns a reference to a cell or range (useful in advanced formulas).

```
=INDEX(reference, row_num, [column_num], [area_num])
```

- **reference** : One or more ranges.
- **area_num** : Specifies which range in the reference to use (if multiple ranges are given).

INDEX + MATCH (Better Alternative to VLOOKUP)

Since **VLOOKUP** can only search left-to-right, **INDEX + MATCH** is more flexible

Class/Subjects	9:30 AM - 10:15 AM
English	=INDEX(A1:J9,MATCH(C15,A1:A9,0),MATCH(D14,A1:J1,0))

Row

INDEX(array, row_num, [column_num])
INDEX(reference, row_num, [column_num], [area_num])

Returns the Name @ ROW, COLUMN

Entire Table

ROW

COLUMN

Class/Subjects	9:30 AM - 10:15 AM
English	English (Ms. Davis)

C15

D14