**DATE AND TIME CALCULATION**

**DATEDIF**

* **Content**: Calculates days/months/years between two dates.
* **Sample Use Case**: Determine tenure years.
* **Syntax:**

=DATEDIF(start\_date, end\_date, unit)

* start\_date: The earlier date (must be a valid Excel date).
* end\_date: The later date (must be a valid Excel date).
* unit: The unit of time to calculate the difference in (case-sensitive):
* "Y": Difference in complete years.
* "M": Difference in complete months.
* "D": Difference in days.
* "MD": Difference in days, ignoring months and years.
* "YM": Difference in months, ignoring years.
* "YD": Difference in days, ignoring years (assumes dates are in the same year).
* **Example**
* Assume cell A1 has the date 1/1/2020 and B1 has 6/15/2025.

=DATEDIF("2025-01-01", "2025-08-03", "M") returns 7 (7 months from Jan 1 to Aug 3, 2025).

**TODAY**

* **Content**: Returns the current date.
* **Sample Use Case**: Calculate dynamic values like tenure of currently working employees, days since expired documents.
* Examples:

=DATEDIF("2024-01-01", TODAY(), "M") returns 19 assuming today’s date August 4, 2025 , as it calculates the number of complete months between January 1, 2024, and August 4, 2025.

=DATEDIF("2024-01-01", TODAY(), "Y") returns 1 as the number of complete months between January 1, 2024, and August 4, 2025 is 1.

**NETWORKDAYS**

* **Content:** Calculates working days between two dates.
* **Sample Use Case:** Measure time to hire or duration between different interview stages.
* **Syntax:**

=NETWORKDAYS(start\_date, end\_date, [holidays])

* start\_date: The starting date of the period (required).
* end\_date: The ending date of the period (required).
* [holidays]: An optional range or array of dates to exclude as holidays.
* **Example 1:**

**=** NETWORKDAYS("2025-01-01", "2025-01-10)

* If A1:A2 contains {"2025-01-01", "2025-01-02"}, this excludes those holidays and returns 7 (Jan 1,2,3, 6, 7, 8, 9, 2025)
* **Example 2:**

**=** NETWORKDAYS("2025-01-01", "2025-01-10", A1:A2)

* If A1:A2 contains {"2025-01-01", "2025-01-02"}, this excludes those holidays and returns 5 (Jan 3, 6, 7, 8, 9, 2025)

**LOGIC**

**IF**

* Purpose: Checks eligibility or status.
* Sample Use Case: Determine if an employee qualifies for a benefit based on tenure.
* Example:
  + Formula: =IF(Years\_of\_Experience>=5, "Eligible", "Not Eligible")
  + Description: Returns "Eligible" if the employee has 5 or more years of experience; otherwise, "Not Eligible".
  + Data (e.g., from the image): If "Years\_of\_Experience" is 8, the result is "Eligible".

**IFERROR**

* Purpose: Handles errors in calculations.
* Sample Use Case: Prevents #DIV/0! errors in bonus-to-sales ratios.
* Example:
  + Formula: =IFERROR(Bonus/Sales, "N/A")
  + Description: Divides "Bonus" by "Sales"; if an error occurs (e.g., Sales = 0), returns "N/A" instead of an error.
  + Data (e.g., from the image): If Sales = 0, the result is "N/A" instead of #DIV/0!.

**ISBLANK**

* Purpose: Checks if a cell is empty.
* Sample Use Case: Flag missing feedback or incomplete onboarding steps.
* Example:
  + Formula: =IF(ISBLANK(A1), "Missing", "Complete")
  + Description: Returns "Missing" if cell A1 is empty; otherwise, "Complete".

**AND / OR**

* Purpose: Evaluates multiple conditions at once.
* Sample Use Case AND: Checks if an employee meets multiple criteria, like salary > $50,000 and performance score > 85.
  + Formula: =IF(AND(Salary>50000, Performance>85), "Meets Criteria", "Does Not Meet")
  + Description: Returns "Meets Criteria" only if both conditions are true.
* Sample Use Case OR: Lists employees who meet any of the criteria, like sales > $200 or training score > 5000.
  + Formula: =IF(OR(Sales>200, Training\_Score>5000), "Qualified", "Not Qualified")
  + Description: Returns "Qualified" if either condition is true.

**LOOKUP AND REFERENCE**

**VLOOKUP**

* **Content**: Pulls data from another table based on a unique identifier.
* **Sample Use Case**: Retrieve names or job titles using employee ID.
* **Syntax:**

=VLOOKUP(lookup\_value, table\_array, col\_index\_num, [range\_lookup])

* lookup\_value: The value to search for (e.g., an EmployeeID).
* table\_array: The range containing the data (e.g., A1:F5, where the first column has the lookup values).
* col\_index\_num: The column number in the range to return a value from (1 = first column, 2 = second column, etc.).
* [range\_lookup]: (Optional) TRUE (approximate match, default) or FALSE (exact match
* Example 1: Assume this table is in cells A1:F5. Find the name of EmployeeID "E102". VLOOKUP("E102", A1:F5, 2, FALSE) searches for E102 in the first column (A), returns **?** from 2nd column (B), using exact match (FALSE).
* Example 2: Look up the salary for EmployeeID "E103".

=VLOOKUP("E103", A1:F5, 2, FALSE) returns **?**

| **EmployeeID** | **Name** | **Job Title** | **Hire Date** | **Salary** | **Exit Date** |
| --- | --- | --- | --- | --- | --- |
| E101 | Alice | Data Analyst | 2024-01-01 | 50000 |  |
| E102 | Bob | Project Manager | 2024-06-01 | 60000 | 2025-07-21 |
| E103 | Carol | Developer | 2023-08-01 | 55000 | 2025-09-01 |
| E104 | Dave | HR Manager | 2025-01-01 | 52000 |  |

**MATCH AND INDEX**

| **Name** | **EmployeeID** | **Job Title** | **Hire Date** | **Salary** | **Exit Date** |
| --- | --- | --- | --- | --- | --- |
| Alice | E101 | Data Analyst | 2024-01-01 | 50000 |  |
| Bob | E102 | Project Manager | 2024-06-01 | 60000 | 2025-07-21 |
| Carol | E103 | Developer | 2023-08-01 | 55000 | 2025-09-01 |
| Dave | E104 | HR Manager | 2025-01-01 | 52000 |  |

* Assume this table is in cells A1:F5 but EmployeeID in the second column.
* As the EmployeeID is in the second column of your table (not the first), VLOOKUP cannot be used directly because it requires the lookup value to be in the first column of the table\_array.
* But, you can use a combination of INDEX and MATCH functions to get names, job titles, or other data using Employee ID in the 2nd column
* **Syntax**
* **MATCH(lookup\_value, lookup\_array, [match\_type])**: Finds the position of the lookup value in a range (use 0 for exact match).
* **INDEX(array, row\_num, [column\_num])**: Returns the value at a specific row and column in a range.
* **Example 1** =INDEX(A1:F5, MATCH("E102", B1:B5, 0), 3)

returns ? as Name for E102. MATCH("E102", B1:B5, 0) finds the row where E102 appears in column B (row 2). INDEX(A1:E5, 2, 3) returns the value from row 2, column 3 (Name column).

* **Example 2 =**INDEX(A1:E5, MATCH("E102", B1:B5, 0), 4)

returns ? as Job Title for E102 .0 means exact match.

**HLOOKUP**

HLOOKUP function in Excel searches for a value in the first row of a table or range and returns a value in the same column from a specified row. It’s similar to VLOOKUP but works horizontally instead of vertically. It’s useful for looking up data in a table where the lookup value is in the top row, such as finding an employee’s metric based on a date or category header.

|  | **E101** | **E102** | **E103** | **E104** |
| --- | --- | --- | --- | --- |
| Salary | 50000 | 60000 | 55000 | 52000 |
| Hire Date | 2024-01-01 | 2024-06-01 | 2023-08-01 | 2025-01-01 |
| Exit Date |  | 2025-07-21 | 2025-09-01 |  |

**Example 1:** Look up the salary for EmployeeID "E104".

**=HLOOKUP("E103", A1:E4, 2, FALSE)**

**Example 2:** Find Exit Date for EmployeeID "E102".

**=HLOOKUP("E102", A1:E4, 4, FALSE)**

**XLOOKUP**

The `XLOOKUP` function in Excel is a modern and versatile replacement for `VLOOKUP` and `HLOOKUP`, offering improved flexibility and functionality. It’s available in Excel for Microsoft 365 and Excel 2021, allowing you to search for a value in a range or array and return a corresponding value from another range, regardless of the direction (left, right, up, or down). Below, I’ll provide an example using your employee data, tailored to the current date (August 4, 2025, 06:32 PM +03).

| **EmployeeID** | **Name** | **Job Title** | **Hire Date** | **Salary** | **Exit Date** |
| --- | --- | --- | --- | --- | --- |
| E101 | Alice | Data Analyst | 2024-01-01 | 50000 |  |
| E102 | Bob | Project Manager | 2024-06-01 | 60000 | 2025-07-21 |
| E103 | Carol | Developer | 2023-08-01 | 55000 | 2025-09-01 |
| E104 | Dave | HR Manager | 2025-01-01 | 52000 |  |

**Syntax**

=XLOOKUP(lookup\_value, lookup\_array, return\_array, [if\_not\_found], [match\_mode], [search\_mode])

* lookup\_value: The value to search for (e.g., an EmployeeID).
* lookup\_array: The range to search in (e.g., EmployeeID column).
* return\_array: The range to return a value from (e.g., Salary or Exit Date column).
* [if\_not\_found]: (Optional) Value to return if no match is found (defaults to #N/A).
* [match\_mode]: (Optional) 0 = exact match (default), -1 = next smaller, 1 = next larger, 2 = wildcard.
* [search\_mode]: (Optional) 1 = first-to-last (default), -1 = last-to-first, 2 = binary ascending, -2 =

**Example 1:** Look up the salary for EmployeeID "E103".

=XLOOKUP("E103", A2:A5, E2:E5)

Lookup Value: "E103" , Lookup Array: A2:A5 (EmployeeID column)

Return Array: E2:E5 (Salary column) , Result: 55000 (Carol’s salary).

**Example 2:** Look up the exit date for EmployeeID "E102", returning "No Exit Date" if none exists.

=XLOOKUP("E102", A2:A5, F2:F5, "No Exit Date")

lookup\_value: "E102",

lookup\_array: A2:A5,

return\_array: F2:F5 (Exit Date column)

if\_not\_found: "No Exit Date" (handles cases like E101 or E104)

Result: `2025-07-21` (Bob’s exit date).

**DATA SUMMARIZATION & RANKING**

**1. COUNTIF**

* **Purpose**: Counts how many items meet a condition or multiple conditions.
* **Sample Use Case**: Track how many candidates progressed to "Hired" status.
* **Example**:
  + Formula: =COUNTIF(Status\_Range, "Hired")
  + Description: Counts the number of cells in Status\_Range (e.g., A2:A100) that contain "Hired".
  + Data (e.g., from the image): If 5 cells in the range have "Hired", the result is 5.

**2. RANK.EQ**

* **Purpose**: Ranks values within a list.
* **Sample Use Case**: Rank employees’ performance scores or training assessment results.
* **Example**:
  + Formula: =RANK.EQ(Score, Score\_Range)
  + Description: Ranks a specific Score (e.g., in B2) within Score\_Range (e.g., B2:B100), with 1 being the highest.
  + Data (e.g., from the image): If scores are 90, 85, 95, and B2 is 85, the result is 2.

**3. AVERAGEIFS**

* **Purpose**: Calculates an average based on multiple conditions.
* **Sample Use Case**: Benchmark average salaries by team or level.
* **Example**:
  + Formula: =AVERAGEIFS(Salary\_Range, Team\_Range, "TeamA", Level\_Range, ">2")
  + Description: Averages Salary\_Range where Team\_Range is "TeamA" and Level\_Range is greater than 2.
  + Data (e.g., from the image): If TeamA salaries are 50000, 60000, 55000, and levels > 2, the result might be 55000.

**4. SUBTOTAL**

* **Purpose**: Performs calculations (like SUM, AVERAGE, COUNT) on filtered data.
* **Sample Use Case**: Calculate total or averages in filtered lists, like a summary of employees.
* **Example**:
  + Formula: =SUBTOTAL(9, Salary\_Range)
  + Description: Sums Salary\_Range (e.g., C2:C100) for visible (filtered) rows only (9 = SUM function in SUBTOTAL).
  + Data (e.g., from the image): If filtered salaries are 50000 and 60000, the result is 110000.

**5. SUMIFS**

* **Purpose**: Sums values that meet one or more conditions.
* **Sample Use Case**: Calculate total hours spent on a specific training topic.
* **Example**:
  + Formula: =SUMIFS(Hours\_Range, Topic\_Range, "Topic1")
  + Description: Sums Hours\_Range where Topic\_Range equals "Topic1".
  + Data (e.g., from the image): If hours for "Topic1" are 10, 15, 20, the result is 45.

**6. SPARKLINE**

* **Purpose**: Creates mini charts within a cell to show trends.
* **Sample Use Case**: Visualize engagement scores or training completion over time.
* **Example**:
  + Formula: =SPARKLINE(Data\_Range)
  + Description: Generates a small line chart in the cell using Data\_Range (e.g., B2:B10) to show trends.
  + Data (e.g., from the image): If Data\_Range is 10, 20, 15, 25, a sparkline shows an upward trend.

**Key Excel Functions for HR Statistics**

1. **AVERAGE**: Calculates the mean of a dataset, e.g., average salary.
   * Formula: =AVERAGE(range)
   * Example: =AVERAGE(E1:E4) to find the average salary.
2. **MEDIAN**: Finds the middle value in a dataset, useful for salary analysis to avoid skew from outliers.
   * Formula: =MEDIAN(range)
   * Example: =MEDIAN(E1:E4) for median salary.
3. **MODE**: Identifies the most frequent value, e.g., most common performance score.
   * Formula: =MODE(range)
   * Example: =MODE(C1:C4) for most frequent job tittle
4. **STDEV.P / STDEV.S**: Measures data dispersion, e.g., variability in employee salaries.
   * Use STDEV.P for the entire population, STDEV.S for a sample.
   * Example: =STDEV.S((E1:E4)for sample salary standard deviation.
5. **SUM**: Calculates the sum of a dataset, e.g., all sum of salaries
   * Formula: =AVERAGE(range)
   * Example: =AVERAGE(E1:E4) to find the average salary.

**Using the Analysis ToolPak**

The Analysis ToolPak is an Excel add-in for advanced statistical analysis.

* **Enable it**: Go to File > Options > Add-ins > Select "Analysis ToolPak" > Click "Go" > Check the box > OK.
* **Descriptive Statistics**:
  1. Go to Data > Data Analysis > Descriptive Statistics.
  2. Select your data range (e.g., salaries in C2:C100).
  3. Choose output options (e.g., new worksheet) and check "Summary Statistics" for mean, median, mode, standard deviation, etc.
  4. Example: Analyze employee performance scores to get a summary of central tendency and variability.

**PivotTables for HR Data Analysis**

PivotTables are powerful for summarizing HR data, e.g., headcount by department or average salary by role.

* **Create a PivotTable**:
  1. Select your data > Insert > PivotTable > Choose output location.
  2. Drag fields (e.g., "Department" to Rows, "Salary" to Values).
  3. Set Value Field Settings to "Count" for headcount or "Average" for mean salary.
* Example: Use a PivotTable to calculate the number of employees per department or average performance score by job role.
* Data Formatting: Ensure data is in an Excel table (Ctrl+T) for easier analysis. Use clear, unique column headers.

**Visualizations**

* **Charts**: Use Excel’s chart tools (Insert > Charts) to visualize HR metrics, like bar charts for department headcounts or line charts for turnover trends.
  + Example: Create a histogram of employee ages using the Analysis ToolPak’s Histogram tool or a bar chart from a PivotTable summary.
* **Dashboards**: Combine PivotTables, slicers, and charts to build interactive HR dashboards, e.g., tracking attrition rates or performance scores.