

HR Data Analysis Assessment



PSYLIQ

TASK 1



1. Using Excel, how would you filter the dataset to only show employees aged 30 and above?

The image shows the Excel ribbon with the 'Number Filters' menu open for the 'Age' column. The 'Number Filters' menu is expanded, showing options like 'Equals...', 'Does Not Equal...', 'Greater Than...', 'Greater Than Or Equal To...', 'Less Than...', 'Less Than Or Equal To...', 'Between...', 'Top 10...', 'Above Average', 'Below Average', and 'Custom Filter...'. The 'Custom Filter...' option is selected, and a search box is visible with the text '(Select All)' and a list of numbers from 18 to 25, all of which are checked.

The image shows the 'Custom AutoFilter' dialog box for the 'Age' column. The 'Show rows where:' section is set to 'is greater than or equal to' with the value '30'. The 'And' radio button is selected. The 'OK' button is highlighted.

EmployeeID	Age	Attrition	BusinessTravel	Department	DistanceFromHome	Education
99	42	No	Travel_Rarely	Sales	2	2
115	35	No	Travel_Rarely	Research & Development	29	3
134	40	No	Travel_Rarely	Sales	6	2
174	54	No	Travel_Rarely	Research & Development	2	4
214	38	No	Travel_Rarely	Research & Development	5	3
265	37	No	Travel_Rarely	Research & Development	16	3
285	38	No	Travel_Rarely	Research & Development	1	3
346	45	No	Travel_Rarely	Research & Development	10	4
371	37	No	Travel_Rarely	Sales	24	2
443	58	Yes	Travel_Rarely	Sales	9	2
487	37	Yes	Travel_Rarely	Sales	15	3
518	43	No	Travel_Rarely	Sales	25	2
554	38	No	Travel_Rarely	Research & Development	7	4
642	49	No	Travel_Rarely	Sales	14	4
644	48	No	Travel_Rarely	Research & Development	1	4
647	48	No	Travel_Rarely	Sales	1	1
759	31	Yes	Travel_Rarely	Sales	20	3
831	42	No	Travel_Rarely	Research & Development	1	3
853	35	Yes	Travel_Rarely	Research & Development	2	3
858	34	No	Travel_Rarely	Research & Development	3	3
948	32	Yes	Travel_Rarely	Sales	1	3
972	40	No	Travel_Rarely	Research & Development	22	2
1000	31	Yes	Travel_Rarely	Human Resources	9	4
1055	31	Yes	Travel_Rarely	Research & Development	2	3
1137	32	No	Travel_Rarely	Research & Development	8	1

Step 1

Step 2

Step 3 : Output

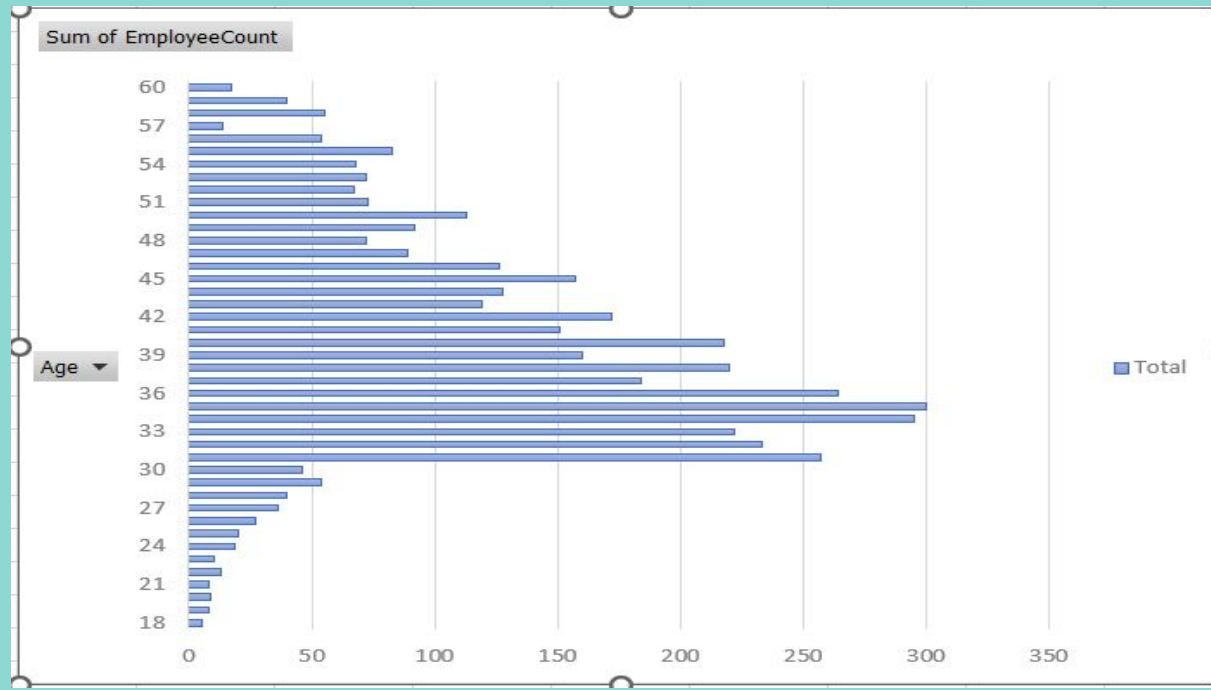
2. Create a pivot table to summarize the average Monthly Income by Job Role.

Row Labels	Average of MonthlyIncome
Healthcare Representative	60494.50928
Human Resources	59314.78788
Laboratory Technician	65518.4359
Manager	64972.82143
Manufacturing Director	67037.37079
Research Director	65655.64
Research Scientist	65409.59908
Sales Executive	66219.45165
Sales Representative	65928.73418
Grand Total	65143.19274

3. Apply conditional formatting to highlight employees with Monthly Income above the company's average income.

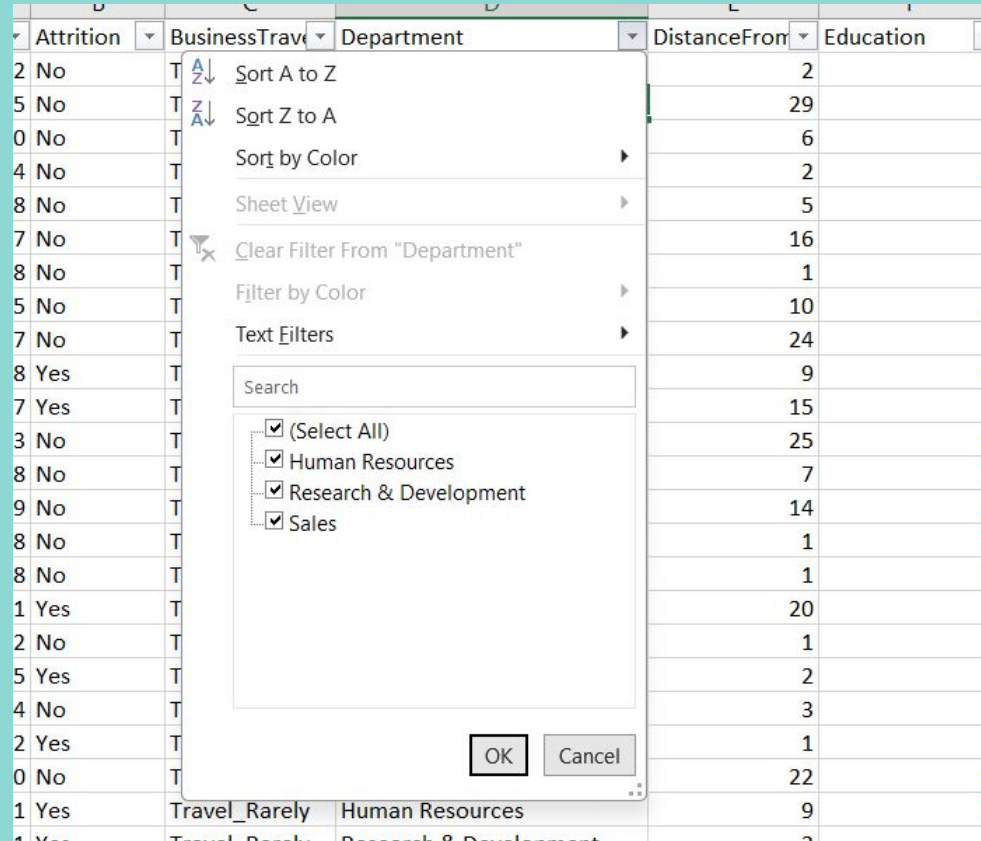
EmployeeID	Age	Attrition	BusinessTravel	Department	DistanceFromHome	Education	EducationField	EmployeeCount	Gender	JobLevel	JobRole	MaritalStatus	MonthlyIncome	NumCompaniesWorked	Over18
99	42	No	Travel_Rarely	Sales	2	2	Medical	1	Female	1	Laboratory Technician	Single	21330	3	Y
115	35	No	Travel_Rarely	Research & Development	29	3	Life Sciences	1	Female	3	Sales Executive	Single	50030	9	Y
134	40	No	Travel_Rarely	Sales	6	2	Life Sciences	1	Female	1	Laboratory Technician	Married	26470	6	Y
174	54	No	Travel_Rarely	Research & Development	2	4	Medical	1	Male	2	Human Resources	Single	89380	7	Y
214	38	No	Travel_Rarely	Research & Development	5	3	Life Sciences	1	Female	1	Research Scientist	Married	154270	3	Y
265	37	No	Travel_Rarely	Research & Development	16	3	Life Sciences	1	Male	3	Manager	Single	33880	3	Y
285	38	No	Travel_Rarely	Research & Development	1	3	Medical	1	Female	3	Manager	Single	96190	4	Y
346	45	No	Travel_Rarely	Research & Development	10	4	Life Sciences	1	Male	1	Research Director	Single	56050	1	Y
371	37	No	Travel_Rarely	Sales	24	2	Life Sciences	1	Female	4	Laboratory Technician	Divorced	42570	4	Y
443	58	Yes	Travel_Rarely	Sales	9	2	Medical	1	Female	4	Sales Executive	Single	59570	4	Y
487	37	Yes	Travel_Rarely	Sales	15	3	Marketing	1	Male	2	Laboratory Technician	Married	44850	5	Y
518	43	No	Travel_Rarely	Sales	25	2	Life Sciences	1	Male	3	Research Scientist	Divorced	50550	5	Y
554	38	No	Travel_Rarely	Research & Development	7	4	Medical	1	Male	1	Sales Executive	Single	66530	7	Y
642	49	No	Travel_Rarely	Sales	14	4	Life Sciences	1	Male	2	Research Scientist	Married	62300	2	Y
644	48	No	Travel_Rarely	Research & Development	1	4	Life Sciences	1	Female	2	Laboratory Technician	Single	132370	5	Y
647	48	No	Travel_Rarely	Sales	1	1	Marketing	1	Male	2	Manufacturing Director	Single	74060	6	Y
759	31	Yes	Travel_Rarely	Sales	20	3	Technical Degree	1	Male	1	Research Scientist	Single	61800	1	Y
831	42	No	Travel_Rarely	Research & Development	1	3	Life Sciences	1	Female	1	Manufacturing Director	Married	106850	4	Y
853	35	Yes	Travel_Rarely	Research & Development	2	3	Medical	1	Female	1	Research Scientist	Divorced	25320	1	Y
858	34	No	Travel_Rarely	Research & Development	3	3	Life Sciences	1	Male	2	Sales Executive	Single	20440	1	Y
948	32	Yes	Travel_Rarely	Sales	1	3	Life Sciences	1	Male	2	Research Scientist	Single	27430	1	Y
972	40	No	Travel_Rarely	Research & Development	22	2	Technical Degree	1	Male	1	Healthcare Representative	Married	23230	2	Y
1000	31	Yes	Travel_Rarely	Human Resources	9	4	Human Resources	1	Male	2	Laboratory Technician	Married	168850	2	Y
1055	31	Yes	Travel_Rarely	Research & Development	2	3	Life Sciences	1	Male	3	Laboratory Technician	Married	21680	0	Y
1137	32	No	Travel_Rarely	Research & Development	8	1	Medical	1	Female	2	Research Scientist	Single	46270	8	Y
1145	31	No	Travel_Rarely	Sales	6	3	Other	1	Male	1	Manufacturing Director	Divorced	45340	1	Y
1251	36	No	Travel_Rarely	Research & Development	25	1	Life Sciences	1	Female	4	Sales Executive	Married	170070	9	Y
1253	35	No	Travel_Rarely	Research & Development	10	1	Medical	1	Male	1	Research Scientist	Divorced	57650	1	Y
1282	36	Yes	Travel_Rarely	Sales	7	2	Life Sciences	1	Male	4	Laboratory Technician	Married	144110	0	Y
1287	36	No	Travel_Rarely	Research & Development	2	3	Life Sciences	1	Male	2	Sales Representative	Married	43200	3	Y
1314	32	No	Travel_Rarely	Human Resources	12	2	Human Resources	1	Female	1	Sales Representative	Single	20610	1	Y
1327	34	No	Travel_Rarely	Sales	4	3	Marketing	1	Female	2	Sales Representative	Divorced	50630	6	Y
1438	59	No	Travel_Rarely	Research & Development	5	3	Life Sciences	1	Female	3	Manager	Married	198330	3	Y
1569	42	No	Travel_Rarely	Sales	2	2	Medical	1	Female	1	Laboratory Technician	Single	21330	3	Y

4. Create a bar chart in Excel to visualize the distribution of employee ages.



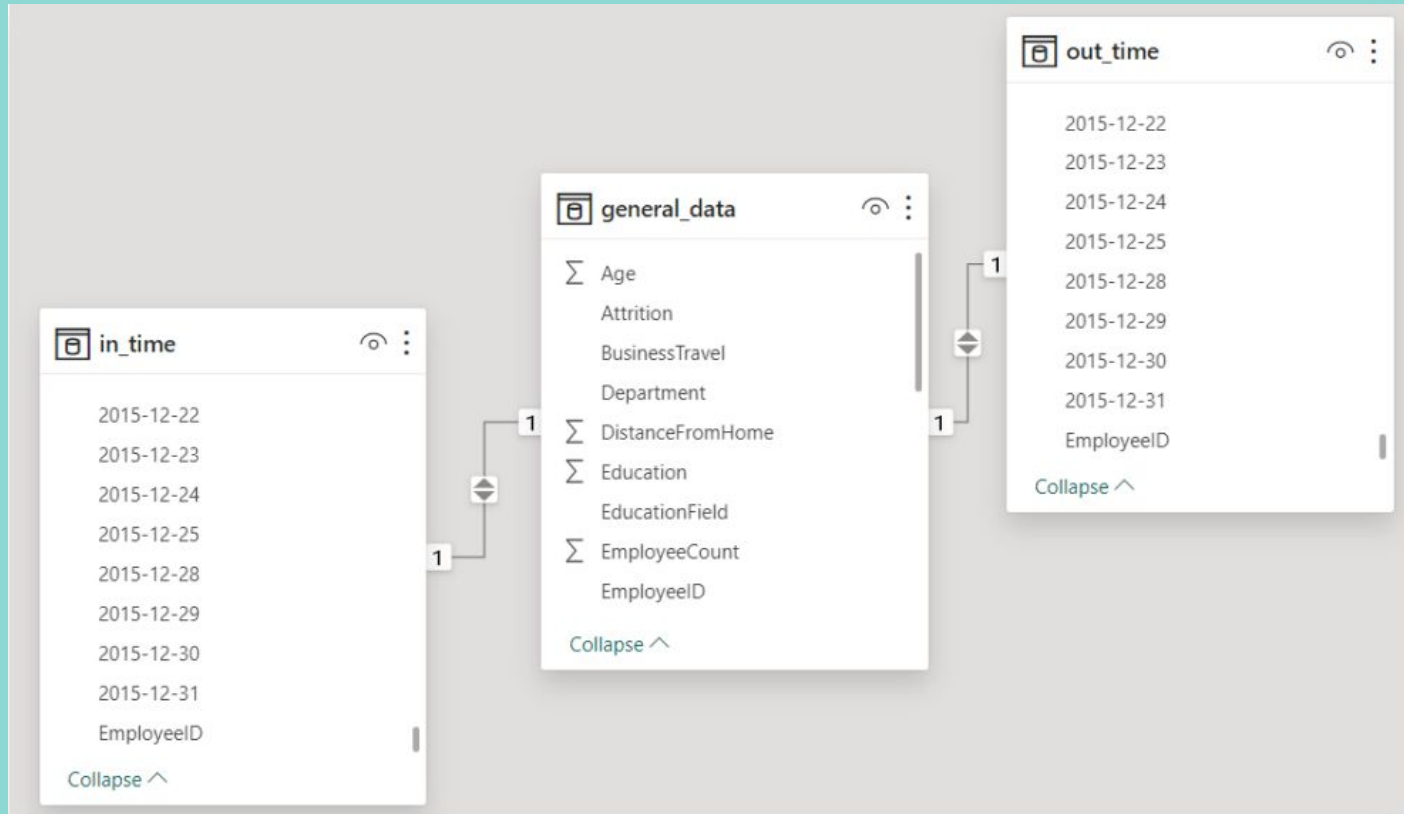
5. Identify and clean any missing or inconsistent data in the "Department" column.

Result:
There's no inconsistent data.



	Attrition	BusinessTravel	Department	DistanceFrom	Education
2	No	T		2	2
5	No	T		29	3
0	No	T		6	2
4	No	T		2	4
8	No	T		5	3
7	No	T		16	3
8	No	T		1	3
5	No	T		10	4
7	No	T		24	2
8	Yes	T		9	2
7	Yes	T		15	3
3	No	T		25	2
8	No	T		7	4
9	No	T		14	4
8	No	T		1	4
8	No	T		1	1
1	Yes	T		20	3
2	No	T		1	3
5	Yes	T		2	3
4	No	T		3	3
2	Yes	T		1	3
0	No	T		22	2
1	Yes	Travel_Rarely	Human Resources	9	4
1	Yes	Travel_Rarely	Research & Development	9	4

6. In Power BI, establish a relationship between the "EmployeeID" in the employee data and the "EmployeeID" in the time tracking data.



7. Using DAX, create a calculated column that calculates the average years an employee has spent with their current manager.



8. Using Excel, create a pivot table that displays the count of employees in each Marital Status category, segmented by Department.

Row Labels	Count of MaritalStatus
Human Resources	190
Divorced	22
Married	102
Single	66
Research & Development	2870
Divorced	617
Married	1401
Single	852
Sales	1350
Divorced	350
Married	587
Single	413
Grand Total	4410

9. Apply conditional formatting to highlight employees with both above-average Monthly Income and above-average Job Satisfaction.

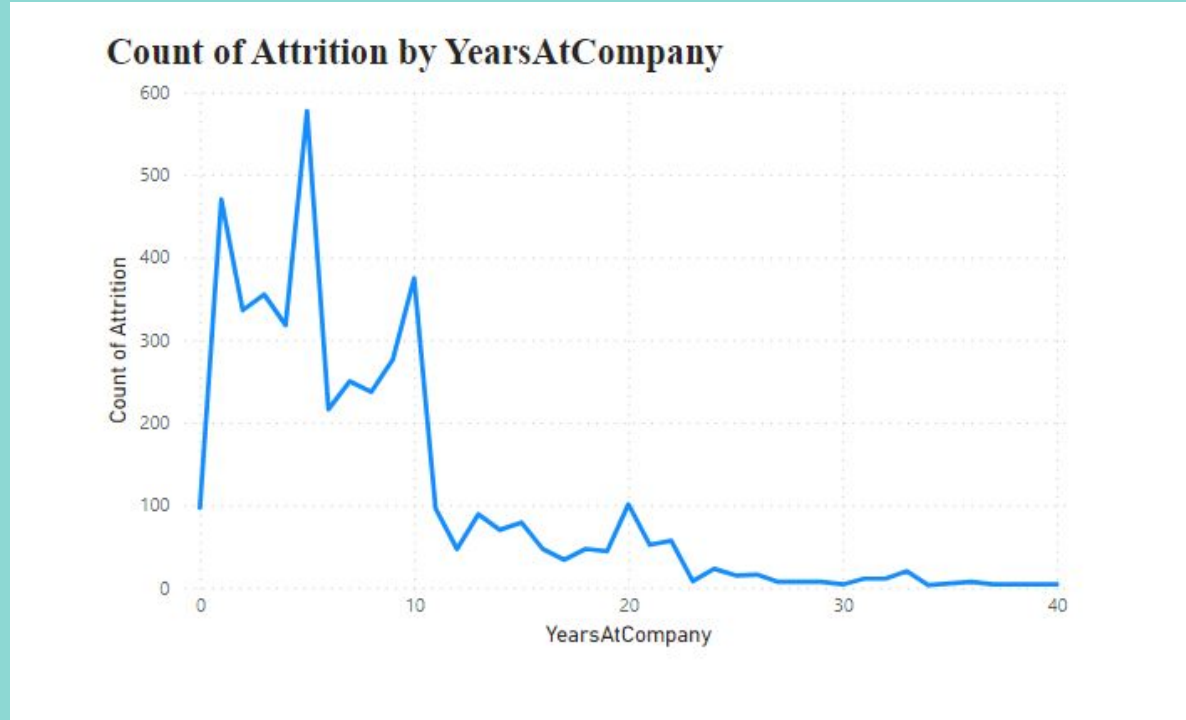
EmployeeID	EnvironmentSatisfaction	JobSatisfaction	WorkLifeBalance
1	3	4	2
2	3	2	4
3	2	2	1
4	4	4	3
5	4	1	3
6	3	2	2
7	1	3	1
8	1	2	3
9	2	4	3
10	2	1	3
11	3	4	3
12	NA	4	3
13	4	1	3
14	1	2	2
15	4	4	2
16	3	4	4
17	4	3	4
18	1	4	3
19	2	2	2
20	1	1	3
21	3	2	1
22	1	2	2
23	3	3	2
24	2	3	3
25	2	4	2
26	2	4	3
27	1	1	3
28	4	4	3
29	4	3	1
30	4	4	3

above-average Job Satisfaction

EmployeeID	Gender	JobLevel	JobRole	MaritalStatus	MonthlyIncome	NumCompaniesWorked	Over18
99	Female	1	Laboratory Technician	Single	21330	3	Y
115	Female	3	Sales Executive	Single	50030	9	Y
134	Female	1	Laboratory Technician	Married	26470	6	Y
174	Male	2	Human Resources	Single	89380	7	Y
214	Female	1	Research Scientist	Married	154270	3	Y
265	Male	3	Manager	Single	33880	3	Y
285	Female	3	Manager	Single	96190	4	Y
346	Male	1	Research Director	Single	56050	1	Y
371	Female	4	Laboratory Technician	Divorced	42570	4	Y
443	Female	4	Sales Executive	Single	59570	4	Y
487	Male	2	Laboratory Technician	Married	44850	5	Y
518	Male	3	Research Scientist	Divorced	50550	5	Y
554	Male	1	Sales Executive	Single	66530	7	Y
642	Male	2	Research Scientist	Married	62300	2	Y
644	Female	2	Laboratory Technician	Single	132370	5	Y
647	Male	2	Manufacturing	Single	74060	6	Y
759	Male	1	Research Scientist	Single	61800	1	Y
831	Female	1	Manufacturing	Married	106850	4	Y
853	Female	1	Research Scientist	Divorced	25320	1	Y
858	Male	2	Sales Executive	Single	20440	1	Y
948	Male	2	Research Scientist	Single	27430	1	Y
972	Male	1	Healthcare Representative	Married	23230	2	Y
1000	Male	2	Laboratory Technician	Married	168850	2	Y
1055	Male	3	Laboratory Technician	Married	21680	0	Y
1137	Female	2	Research Scientist	Single	46270	8	Y
1145	Male	1	Manufacturing	Divorced	45340	1	Y
1251	Female	4	Sales Executive	Married	170070	9	Y
1253	Male	1	Research Scientist	Divorced	57650	1	Y
1282	Male	4	Laboratory Technician	Married	144110	0	Y
1287	Male	2	Sales Representative	Married	43200	3	Y
1314	Female	1	Sales Representative	Single	20610	1	Y
1327	Female	2	Sales Representative	Divorced	50630	6	Y
1438	Female	3	Manager	Married	198330	3	Y
1569	Female	1	Laboratory Technician	Single	21330	3	Y
1585	Female	3	Sales Executive	Single	50030	9	Y
1604	Female	1	Laboratory Technician	Married	26470	6	Y
1644	Male	2	Human Resources	Single	89380	7	Y

above-average Monthly Income

10. In Power BI, create a line chart that visualizes the trend of Employee Attrition over the years.



11. Describe how you would create a star schema for this dataset, explaining the benefits of doing so.

To create a star schema from this dataset, the data must be organized into separate 'Fact' and 'Dimensions' tables with relevant columns and foreign keys. The process involves:

1. Normalization of Tables:

- Divide the dataset into multiple tables, including a central 'Employee Attrition Fact Table,' 'Satisfaction Fact Table,' and 'Job Performance Fact Table' in the star schema.

2. Creation of Dimension Tables:

- Develop Dimension tables for Employee, Satisfaction, Job Performance, and In-Out Time.

3. Establishing Relationships:

- All Dimension tables must have a primary key 'EmployeeID' linked to the corresponding foreign key 'Employee ID' in Fact tables to ensure accurate data relationships.

4. Analysis and Reporting:

- To ensure accurate analysis and reporting in Power BI, it is important to establish correct data relationships. This will help facilitate the process of analyzing and interpreting data more effectively.

Benefits of Star Schema:

A) Simplicity and Understandability:

- Enhances clarity and comprehension for both technical and non-technical users.

B) Efficient Querying:

- Separating dimensions and facts can improve the efficiency of queries, especially for aggregating and reporting data.

C) Scalability and Flexibility:

- The star schema is capable of handling large datasets and can easily adjust to changing reporting needs.

D) Reduced Data Redundancy and Enhanced Security:

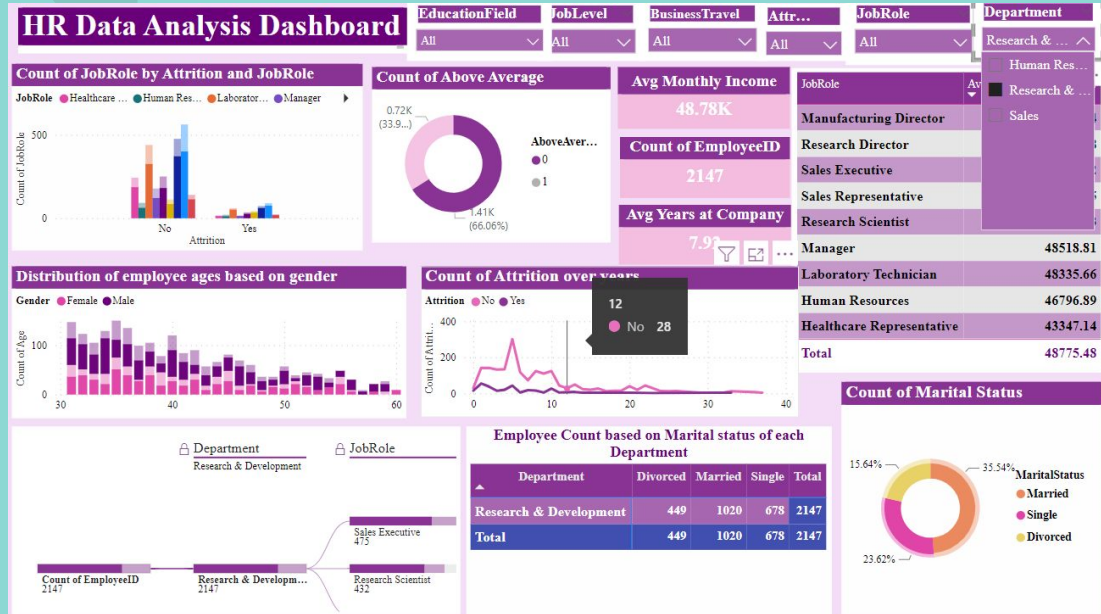
- Minimizes data redundancy, and security is efficiently managed through access controls at both dimension and fact table levels.

12. Using DAX, calculate the rolling 3-month average of Monthly Income for each employee.

Rolling3MonthsAverage

43.85K

13. Create a hierarchy in Power BI that allows users to drill down from Department to Job Role to further narrow their analysis.



14. How can you set up parameterized queries in Power BI to allow users to filter data based on the Distance from Home column?

1. Create the Parameter:

- i. In Power BI Desktop, go to the Home tab in the Power Query Editor.
- ii. Click Manage Parameters and then New Parameters.
- iii. Fill in the details
- iv. Click OK.

2. Apply the Parameter in the Query:

- i. Open the query that contains the Distance from Home column.
- ii. Right-click the column header and select Filter Rows.
- iii. In the Filter Rows dialog box, select Greater Than or Less Than, or other comparison options as required.
- iv. Click the dropdown for the value and select Parameter(Distance from Home parameter).
- v. Click OK.

3. Customize the Parameter Experience:

- i. In the report view, click Edit Parameters on the Home tab to enable users to modify the parameter value.
- ii. Please create a slicer visual using the specified parameter. This will provide a more user-friendly and intuitive way of filtering the data.

4. Test and Refresh

- i. Test the filtering by changing the parameter value.
- ii. Refresh the data to apply the filtering based on the new value.

15. In Excel, calculate the total Monthly Income for each Department, considering only the employees with a Job Level greater than or equal to 3.

Sum of MonthlyIncome	Column Labels				
Row Labels	3	4	5	Grand Total	
Human Resources	1518490	529730	1085510	3133730	
Research & Development	27968120	14981450	9750290	52699860	
Sales	11082760	9124140	2142220	22349120	
Grand Total	40569370	24635320	12978020	78182710	

16. Explain how to perform a What-If analysis in Excel to understand the impact of a 10% increase in Percent Salary Hike on Monthly Income.

1. Create the Parameter:

- i. In Power BI Desktop, go to the Home tab in the Power Query Editor.
- ii. Click Manage Parameters and then New Parameters.
- iii. Fill in the details
- iv. Click OK.

2. Apply the Parameter in the Query:

- i. Open the query that contains the Distance from Home column.
- ii. Right-click the column header and select Filter Rows.
- iii. In the Filter Rows dialog box, select Greater Than or Less Than, or other comparison options as required.
- iv. Click the dropdown for the value and select Parameter(Distance from Home parameter).
- v. Click OK.

3. Customize the Parameter Experience:

- i. In the report view, click Edit Parameters on the Home tab to enable users to modify the parameter value.
- ii. Please create a slicer visual using the specified parameter. This will provide a more user-friendly and intuitive way of filtering the data.

4. Test and Refresh

- i. Test the filtering by changing the parameter value.
- ii. Refresh the data to apply the filtering based on the new value.

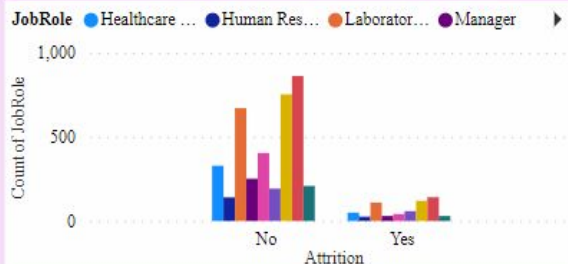
17. Verify if the data adheres to a predefined schema. What actions would you take if you find inconsistencies?

- 1) Verifying if data adheres to a predefined schema involves checking whether the actual data in a dataset aligns with the expected structure and rules outlined in the predefined schema.
- 2) As per current status of the data, there is a need to reorder EmployeeID column, changing data type of 'TotalWorkingHours' column, filling NA values and blank values from general_data, employee_survey_data, manager_survey_data.
- 3) There is 'EmployeeID' label missing in the 'in-time' and 'out-time' data. 4) It is essential to address any inconsistencies in data files and carefully validate data profiling.
- 5) The dataset will conform to the predefined schema once inconsistencies are resolved and data quality measures are implemented.

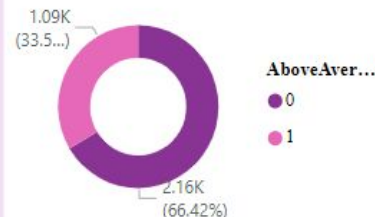
HR Data Analysis Dashboard

EducationField	JobLevel	BusinessTr...	Attr...	JobRole	Department
All	All	All	All	All	All

Count of JobRole by Attrition and JobRole



Count of Above Average



Avg Monthly Income

65.14K

Count of EmployeeID

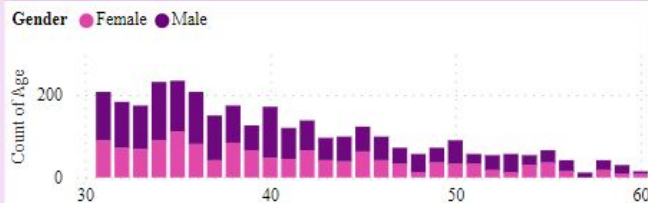
4410

Avg Years at Company

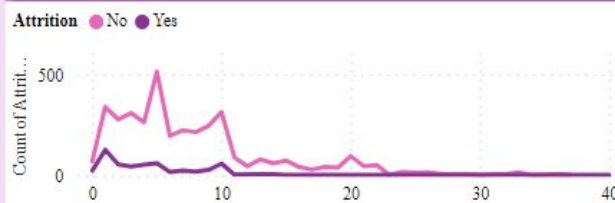
7.69

JobRole	Average of MonthlyIncome
Sales Representative	65928.73
Sales Executive	66219.45
Research Scientist	65409.60
Research Director	65655.64
Manufacturing Director	67037.37
Manager	64972.82
Laboratory Technician	65518.44
Human Resources	59314.79
Healthcare Representative	60494.51
Total	65143.19

Distribution of employee ages based on gender



Count of Attrition over years



Department

Research & Development

JobRole

Sales Executive
652

Research Scientist
549

Research & Developm...
2870

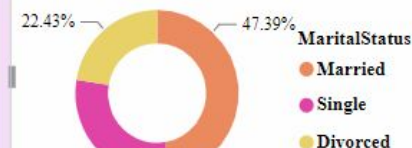
Sales
1350

Count of EmployeeID
4410

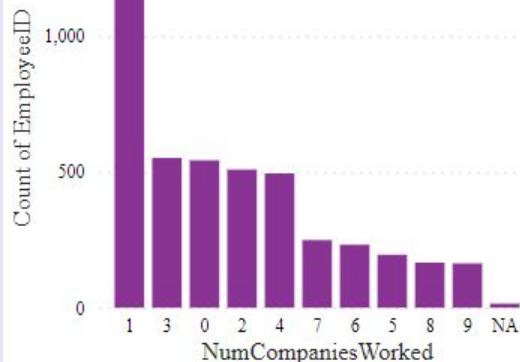
Employee Count based on Marital status of each Department

Department	Divorced	Married	Single	Total
Human Resources	22	102	66	190
Research & Development	617	1401	852	2870
Sales	350	587	413	1350
Total	989	2090	1331	4410

Count of Marital Status



Count of EmployeeID by Number Companies Worked



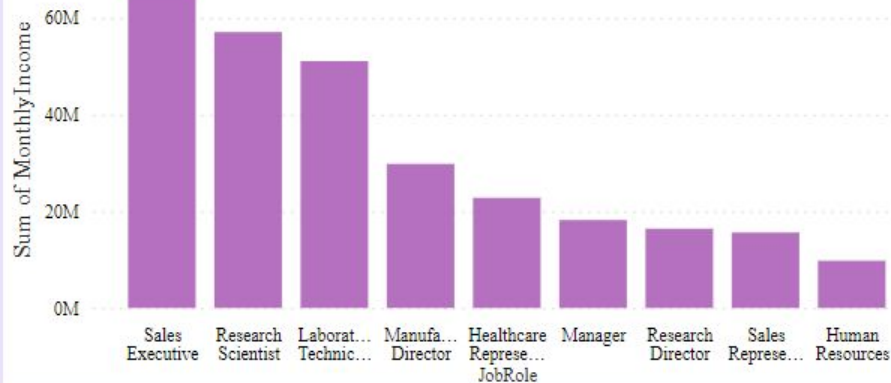
Max of MonthlyIncome

200K

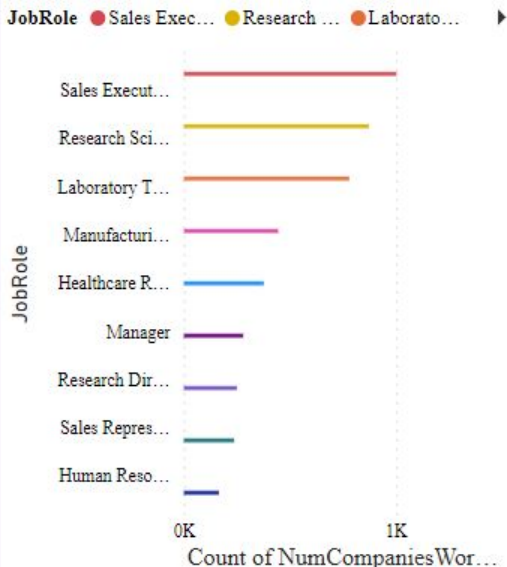
Max of MonthlyIncome

10K

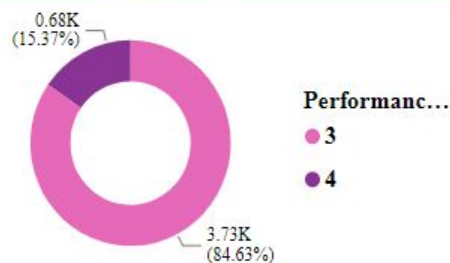
Sum of MonthlyIncome by JobRole



Count of NumCompaniesWorked by JobRole



Count of EmployeeID by PerformanceRating



EmployeeID

All

Gender wise employees Marital status

Gender ● Female ● Male

