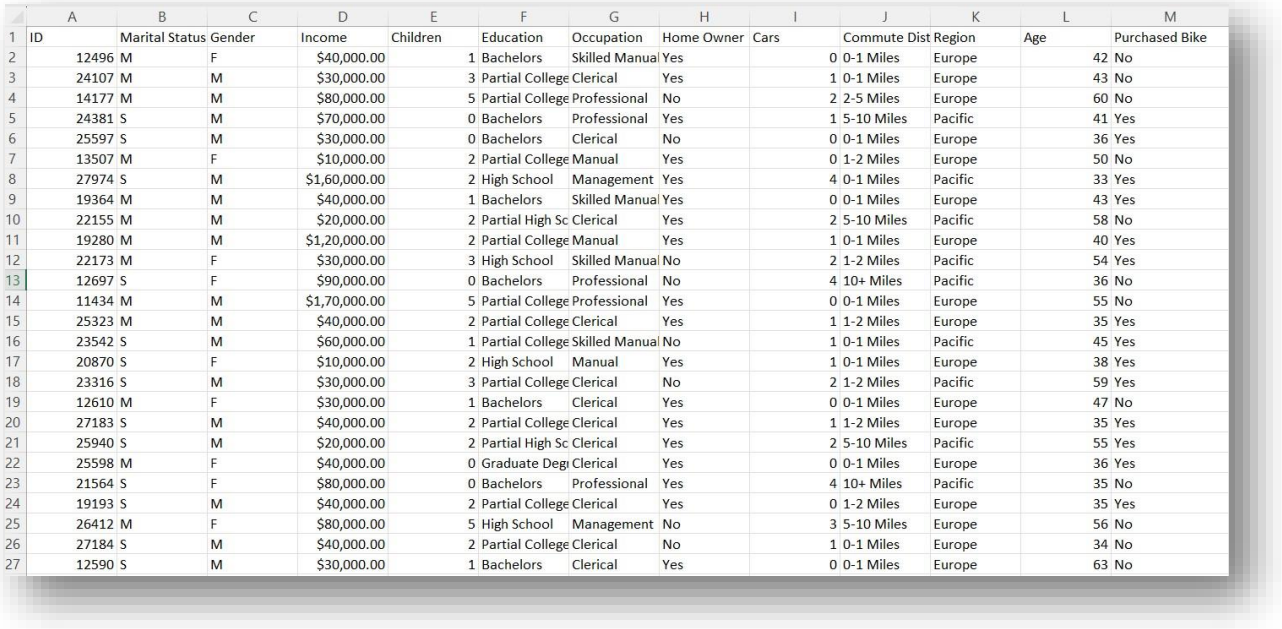
EXCEL DATA ANALYTICS PROJECT

PROJECT OVERVIEW:

The project revolves around the analysis of a dataset containing information related to bike sales. By scrutinizing various demographic and socioeconomic factors, the aim is to discern patterns and trends that influence consumer behaviour in the bike sales market. This endeavor encompasses data preprocessing, analysis, visualization, and dashboard creation, with the ultimate goal of extracting actionable insights to inform marketing strategies and business decisions.

DATASET DESCRIPTION: The dataset comprises several key columns, including:

- **ID:** Unique identifier for each individual record.
- **Marital Status:** Indicates whether an individual is married or single.
- **Gender:** Specifies the gender of the individual.
- **Income:** Represents the income level of the individual.
- **Children:** Denotes the number of children the individual has.
- **Education:** Reflects the educational attainment of the individual.
- **Occupation:** Describes the occupation of the individual.
- **Home Owner:** Indicates whether the individual owns a home.
- **Cars:** Specifies the number of cars owned by the individual.
- **Commute Distance:** Represents the distance the individual commutes.
- **Region:** Specifies the region where the individual resides.
- **Age:** Represents the age of the individual.
- **Purchased Bikes:** Indicates whether the individual has purchased bikes.



	A	B	C	D	E	F	G	H	I	J	K	L	M
1	ID	Marital Status	Gender	Income	Children	Education	Occupation	Home Owner	Cars	Commute Dist	Region	Age	Purchased Bike
2	12496	M	F	$40,000.00	1	Bachelors	Skilled Manual	Yes	0	0-1 Miles	Europe	42	No
3	24107	M	M	$30,000.00	3	Partial College	Clerical	Yes	1	0-1 Miles	Europe	43	No
4	14177	M	M	$80,000.00	5	Partial College	Professional	No	2	2-5 Miles	Europe	60	No
5	24381	S	M	$70,000.00	0	Bachelors	Professional	Yes	1	5-10 Miles	Pacific	41	Yes
6	25597	S	M	$30,000.00	0	Bachelors	Clerical	No	0	0-1 Miles	Europe	36	Yes
7	13507	M	F	$10,000.00	2	Partial College	Manual	Yes	0	1-2 Miles	Europe	50	No
8	27974	S	M	$1,60,000.00	2	High School	Management	Yes	4	0-1 Miles	Pacific	33	Yes
9	19364	M	M	$40,000.00	1	Bachelors	Skilled Manual	Yes	0	0-1 Miles	Europe	43	Yes
10	22155	M	M	$20,000.00	2	Partial High Sc	Clerical	Yes	2	5-10 Miles	Pacific	58	No
11	19280	M	M	$1,20,000.00	2	Partial College	Manual	Yes	1	0-1 Miles	Europe	40	Yes
12	22173	M	F	$30,000.00	3	High School	Skilled Manual	No	2	1-2 Miles	Pacific	54	Yes
13	12697	S	F	$90,000.00	0	Bachelors	Professional	No	4	10+ Miles	Pacific	36	No
14	11434	M	M	$1,70,000.00	5	Partial College	Professional	Yes	0	0-1 Miles	Europe	55	No
15	25323	M	M	$40,000.00	2	Partial College	Clerical	Yes	1	1-2 Miles	Europe	35	Yes
16	23542	S	M	$60,000.00	1	Partial College	Skilled Manual	No	1	0-1 Miles	Pacific	45	Yes
17	20870	S	F	$10,000.00	2	High School	Manual	Yes	1	0-1 Miles	Europe	38	Yes
18	23316	S	M	$30,000.00	3	Partial College	Clerical	No	2	1-2 Miles	Pacific	59	Yes
19	12610	M	F	$30,000.00	1	Bachelors	Clerical	Yes	0	0-1 Miles	Europe	47	No
20	27183	S	M	$40,000.00	2	Partial College	Clerical	Yes	1	1-2 Miles	Europe	35	Yes
21	25940	S	M	$20,000.00	2	Partial High Sc	Clerical	Yes	2	5-10 Miles	Pacific	55	Yes
22	25598	M	F	$40,000.00	0	Graduate Degr	Clerical	Yes	0	0-1 Miles	Europe	36	Yes
23	21564	S	F	$80,000.00	0	Bachelors	Professional	Yes	4	10+ Miles	Pacific	35	No
24	19193	S	M	$40,000.00	2	Partial College	Clerical	Yes	0	1-2 Miles	Europe	35	Yes
25	26412	M	F	$80,000.00	5	High School	Management	No	3	5-10 Miles	Europe	56	No
26	27184	S	M	$40,000.00	2	Partial College	Clerical	No	1	0-1 Miles	Europe	34	No
27	12590	S	M	$30,000.00	1	Bachelors	Clerical	Yes	0	0-1 Miles	Europe	63	No

OBJECTIVE:

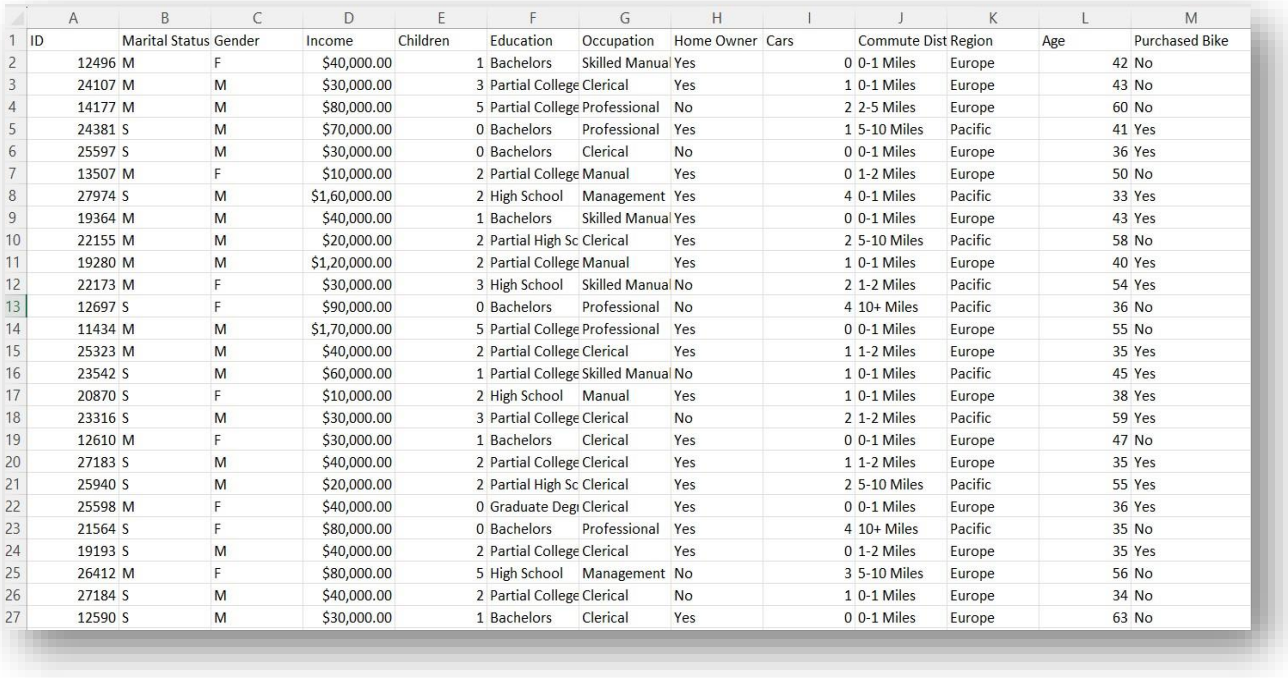
The primary objective of this project is to unravel the underlying factors driving bike purchases among consumers. By leveraging advanced data analysis techniques, we seek to uncover correlations, trends, and insights that shed light on consumer preferences and behaviors. These insights will not only aid in understanding the dynamics of the bike sales market but also empower businesses to tailor their marketing efforts and product offerings to better cater to consumer needs.

METHODOLGY:

Data Preprocessing:

- **Duplicate Data Removal**:
  - Mention the identification and removal of any duplicate rows from the dataset.
- **Standardization of Columns**:
  - Describe the process of replacing abbreviations in the "Gender" and "Marital Status" columns with full terms (e.g., "M" with "Male", "F" with "Female", "M" with "Married", "S" with "Single").

- **Age Bracket Creation**:



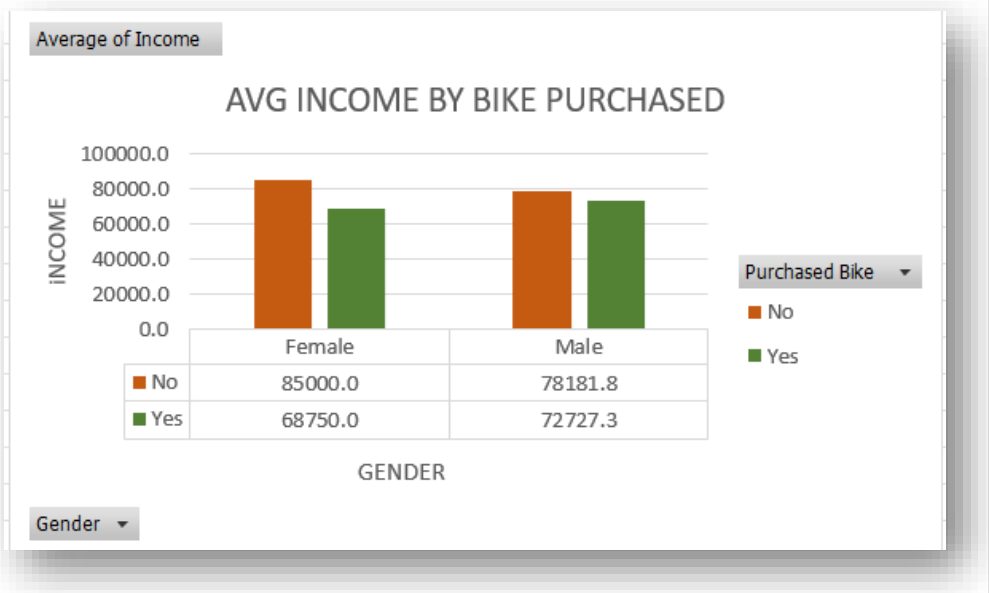
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	ID	Marital Status	Gender	Income	Children	Education	Occupation	Home Owner	Cars	Commute Dist	Region	Age	Purchased Bike
2	12496	M	F	$40,000.00	1	Bachelors	Skilled Manual	Yes	0	0-1 Miles	Europe	42	No
3	24107	M	M	$30,000.00	3	Partial College	Clerical	Yes	1	0-1 Miles	Europe	43	No
4	14177	M	M	$80,000.00	5	Partial College	Professional	No	2	2-5 Miles	Europe	60	No
5	24381	S	M	$70,000.00	0	Bachelors	Professional	Yes	1	5-10 Miles	Pacific	41	Yes
6	25597	S	M	$30,000.00	0	Bachelors	Clerical	No	0	0-1 Miles	Europe	36	Yes
7	13507	M	F	$10,000.00	2	Partial College	Manual	Yes	0	1-2 Miles	Europe	50	No
8	27974	S	M	$1,60,000.00	2	High School	Management	Yes	4	0-1 Miles	Pacific	33	Yes
9	19364	M	M	$40,000.00	1	Bachelors	Skilled Manual	Yes	0	0-1 Miles	Europe	43	Yes
10	22155	M	M	$20,000.00	2	Partial High Sc	Clerical	Yes	2	5-10 Miles	Pacific	58	No
11	19280	M	M	$1,20,000.00	2	Partial College	Manual	Yes	1	0-1 Miles	Europe	40	Yes
12	22173	M	F	$30,000.00	3	High School	Skilled Manual	No	2	1-2 Miles	Pacific	54	Yes
13	12697	S	F	$90,000.00	0	Bachelors	Professional	No	4	10+ Miles	Pacific	36	No
14	11434	M	M	$1,70,000.00	5	Partial College	Professional	Yes	0	0-1 Miles	Europe	55	No
15	25323	M	M	$40,000.00	2	Partial College	Clerical	Yes	1	1-2 Miles	Europe	35	Yes
16	23542	S	M	$60,000.00	1	Partial College	Skilled Manual	No	1	0-1 Miles	Pacific	45	Yes
17	20870	S	F	$10,000.00	2	High School	Manual	Yes	1	0-1 Miles	Europe	38	Yes
18	23316	S	M	$30,000.00	3	Partial College	Clerical	No	2	1-2 Miles	Pacific	59	Yes
19	12610	M	F	$30,000.00	1	Bachelors	Clerical	Yes	0	0-1 Miles	Europe	47	No
20	27183	S	M	$40,000.00	2	Partial College	Clerical	Yes	1	1-2 Miles	Europe	35	Yes
21	25940	S	M	$20,000.00	2	Partial High Sc	Clerical	Yes	2	5-10 Miles	Pacific	55	Yes
22	25598	M	F	$40,000.00	0	Graduate Degr	Clerical	Yes	0	0-1 Miles	Europe	36	Yes
23	21564	S	F	$80,000.00	0	Bachelors	Professional	Yes	4	10+ Miles	Pacific	35	No
24	19193	S	M	$40,000.00	2	Partial College	Clerical	Yes	0	1-2 Miles	Europe	35	Yes
25	26412	M	F	$80,000.00	5	High School	Management	No	3	5-10 Miles	Europe	56	No
26	27184	S	M	$40,000.00	2	Partial College	Clerical	No	1	0-1 Miles	Europe	34	No
27	12590	S	M	$30,000.00	1	Bachelors	Clerical	Yes	0	0-1 Miles	Europe	63	No

- Explain the logic behind creating the "Age Brackets" column based on age filters (e.g., "Adolescent", "Middle-aged", "Old-aged")

DATA ANALYSIS AND VISUALIZATION

- **Pivot Table Creation**:
  - Pivot tables allow you to summarize and aggregate data quickly and easily. You can calculate various summary statistics such as sums, averages, counts, minimums, and maximums for different categories of data.
- **Average Income Analysis**:
  - Detail the process of calculating the average income for bike buyers and non-buyers based on gender.

Average of Income	Column Labels		
Row Labels	No	Yes	Grand Total
Female	85000.0	68750.0	74166.7
Male	78181.8	72727.3	75454.5
Grand Total	**80000.0**	**71052.6**	**75000.0**



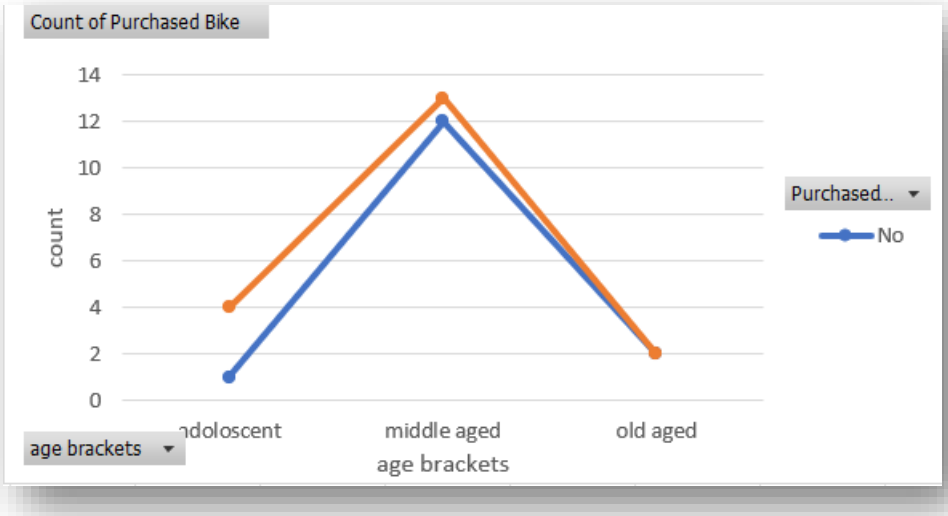
- **Bike Purchases Based on Commute Distance**:

  - Explain how the count of bike purchases was analyzed based on commute distance.

Count of Commute	Column Labels		
Row Labels	No	Yes	Grand Total
0-1 Miles	2	9	11
1-2 Miles	2	3	5
2-5 Miles	4	3	7
5-10 Miles	3	2	5
More than 10 miles	4	2	6
Grand Total	**15**	**19**	**34**

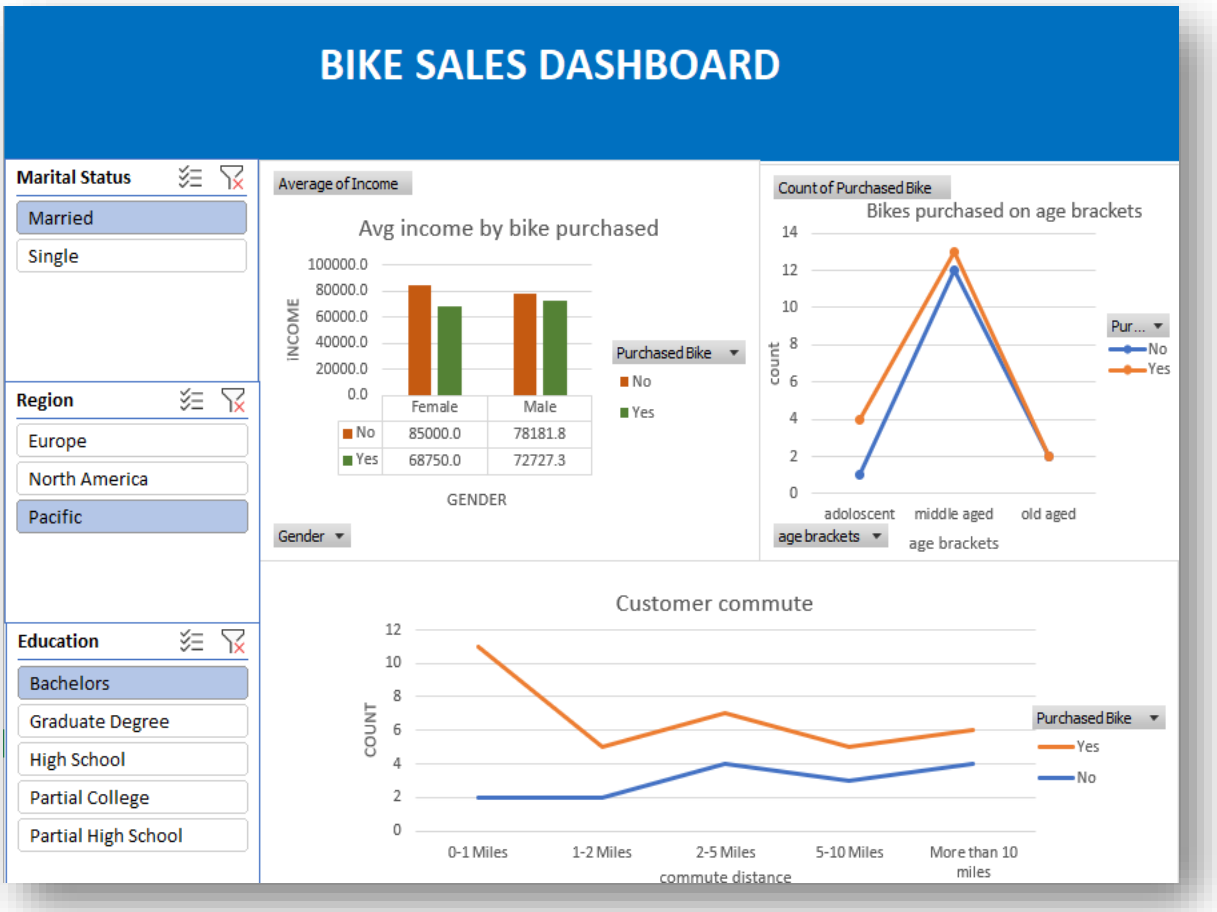
- **Bike Purchases Based on Age Brackets**:
    - Describe the analysis of bike purchases by age brackets.

Count of Purchased	Column Labels		
Row Labels	**No**	**Yes**	**Grand Total**
adoloscent	1	4	5
middle aged	12	13	25
old aged	2	2	4
Grand Total	**15**	**19**	**34**



Dashboard Creation:

- **Dashboard Components**:
  - Outline the components of the bike sales dashboard, including slicers for marital status, region, and qualification.
  - Explain how the dashboard facilitates data exploration and filtering for deeper insights.



CONCLUSION

Summary of Findings: Through meticulous analysis of the bike sales dataset, several key insights have been uncovered, shedding light on the underlying factors driving consumer behaviour in the bike sales market.

1. **Demographic Influences**: Analysis revealed significant correlations between demographic factors such as age, gender, marital status, and income level, and the likelihood of bike purchases. For instance, middle-aged individuals with higher incomes were more inclined to purchase bikes compared to younger or older demographics.

2. **Geographical Trends**: Regional variations in bike sales patterns were observed, with certain regions exhibiting higher demand for bikes compared to others. Factors such as population density, urbanization, and local infrastructure likely play a role in shaping these geographical trends.

3. **Commute Distance Impact**: Analysis of commute distance indicated that individuals with shorter commute distances were more likely to purchase bikes, possibly due to the convenience and cost-effectiveness of biking for shorter distances.

4. **Educational and Occupational Factors**: Educational attainment and occupation also emerged as influential factors, with individuals in certain professions or with higher levels of education showing a greater propensity for bike purchases.

Conclusion Statement: In conclusion, the analysis of the bike sales dataset has yielded valuable insights into consumer behaviour and market dynamics, providing businesses with actionable intelligence to drive strategic decision-making and enhance competitiveness in the bike sales market. By leveraging these insights and embracing a data-driven approach, businesses can position themselves for success in an increasingly dynamic and competitive marketplace.