SmartPath Project – Week 1 Assignment

Instructions
1. Create one notebook named SmartPath_Week1_.ipynb.
2. Each task must include executable Python code.
3. Use markdown cells only to label each task.

Task 1: Python Setup & Data Creation (15 Marks)
1 Create variables for city name, number of road segments, and average speed.
2 Print a formatted sentence using the variables.
3 Create a Python list containing speeds of at least 6 road segments.

Task 2: Python Logic on Traffic Data (15 Marks)
1 Using a loop, print each road speed from the list.
2 Identify and print road speeds that are less than 30 km/h.
3 Count how many roads are traffic-prone (speed < 30 km/h).

Task 3: NumPy – Speed & Time Computation (20 Marks)
1 Convert the speed list into a NumPy array.
2 Compute mean, maximum, minimum speed.
3 Assume each road is 2 km long and compute travel time for each road.

Task 4: Pandas – Traffic DataFrame Operations (30 Marks)
1 Create a Pandas DataFrame with columns: Road_ID, Speed, Length.
2 Add a new column Travel_Time.
3 Sort the DataFrame based on Travel_Time.
4 Add a column Traffic_Level based on speed ranges.

Task 5: Matplotlib – Traffic Visualization (20 Marks)
1 Plot Speed vs Road_ID using a line plot.
2 Plot Travel_Time vs Road_ID using a bar plot.
3 Add title, axis labels, and grid to both plots.

Bonus (Optional)
Create a scatter plot showing Speed vs Travel_Time using Matplotlib.