# **Functions:**

* Check if a number is even or odd
* Check if a number is divisible by 5
* Check if a character is a vowel or consonant
* Check if a number is in a given range
* Check if a password is strong (length > 8)
* Determine the grade based on marks
* Count how many times 'a' appears in a string
* Function to calculate the area of a rectangle
* Function to convert Celsius to Fahrenheit
* Function to count words in a sentence
* Convert Miles to Kilometers

# **Python pandas:**

Use this data:   
data = {

'Name': ['Anna', 'Brian', 'Chris', 'Derek', 'Ella',

'Finn', 'Gina', 'Henry', 'Isla', 'James',

'Karen', 'Liam', 'Mason', 'Nora', 'Owen',

'Paul', 'Quinn', 'Rachel', 'Steve', 'Tina',

'Uma', 'Victor', 'Wendy', 'Xander', 'Yasmine'],

'Age': [22, 34, 28, None, 30,

72, None, 29, 33, 81,

None, 35, 42, 39, 25,

None, 31, 67, 29, 40,

23, 38, None, 44, 32],

'Address': ['New York, 500 Wall St, 10005', 'Los Angeles, 200 Hollywood Blvd, 90028', 'Chicago, 150 Michigan Ave, 60611',

'Houston, 300 Main St, 77002', 'Phoenix, 400 Desert Rd, 85002',

'San Francisco, 700 Market St, 94108', 'Dallas, 600 Elm St, 75202', None,

'Seattle, 890 Rain St, 98102', 'Boston, 250 Beacon St, 02109',

None, 'Atlanta, 450 Peach St, 30302', 'Denver, 520 Mile Rd, 80202',

'Orlando, 789 Disney Rd, 32802', 'San Diego, 650 Sunset Blvd, 92101',

'Las Vegas, 111 Strip Ave, 89109', 'Portland, 987 Rose St, 97205',

'Philadelphia, 765 Liberty Rd, 19102', 'Nashville, 303 Country Rd, 37201',

'Minneapolis, 1500 Twin St, 55401',

'Detroit, 120 Motor Rd, 48201', 'Charlotte, 888 Queen St, 28202',

'Indianapolis, 678 Speedway Ave, 46204', 'Columbus, 444 State St, 43215',

'New Orleans, 555 Bourbon St, 70130'],

'Salary': [55000, 72000, None, 83000, None,

75000, 62000, None, 69000, None,

60000, 78000, None, 85000, 58000,

95000, None, 102000, None, 89000,

56000, 88000, 70000, None, 73000],

'Job Title': ['Software Engineer', 'Data Analyst', 'Product Manager', 'Marketing Specialist', 'HR Coordinator',

None, 'Business Analyst', 'Data Scientist', 'UX Designer', 'DevOps Engineer',

'Accountant', 'Sales Manager', 'Security Analyst', 'Software Developer', 'Digital Marketer',

None, 'Scrum Master', 'Financial Analyst', 'Cybersecurity Engineer', 'Customer Success Manager',

None, 'AI Engineer', 'Graphic Designer', 'Cloud Engineer', 'Supply Chain Manager']

}

And apply this step:

# **Steps for Data Preprocessing:**

1. Create a DataFrame
2. Display the original DataFrame
3. Replace null values with forward fill
4. Remove duplicates
5. Split the Address column into City, Street, and Zip Code
6. Clean up extra spaces in the new columns
7. Fill missing Age values with the correct statistic method depends on data distripution
8. Standardize capitalization for Name and City
9. Drop any remaining rows with missing values
10. Display the cleaned DataFrame

# **Steps for Data Visualization using pandas:**

1. Bar plot of the most common job titles
2. Histogram of Age to check skewness
3. Histogram of Salary to detect outliers