Q1. How to load excel data into data set?

Q2. How to load csv data into data set?

Q3. How to read csv data?

To master **handling Excel and CSV files in Python**, you’ll want to get comfortable with a set of powerful libraries, functions, and tools. These help with reading, writing, manipulating data, applying formulas, styling, and automating spreadsheet tasks. Here's a complete guide:

**🔧 1. Core Libraries to Master**

**🟢 CSV Files**

| **Library** | **Purpose** |
| --- | --- |
| csv (built-in) | Basic reading/writing of CSVs |
| pandas | High-level data manipulation, fast and efficient |
| numpy | Works with numerical data from CSVs (often with pandas) |

**🟡 Excel Files**

| **Library** | **Purpose** |
| --- | --- |
| openpyxl | Read/write Excel .xlsx, apply formulas, styles |
| xlsxwriter | Create Excel files with formatting, charts, formulas |
| pandas | Easy read/write via wrappers over openpyxl, xlsxwriter |
| pyexcel / pyexcel-xlsx | Read/write/convert between formats |
| xlrd, xlwt | Older libraries for .xls (deprecated for .xlsx) |
| formulas | Evaluate Excel formulas in Python |
| xlwings | Automate Excel through COM (Windows only) |

**📥 2. Reading Files**

**CSV:**

import csv

with open('data.csv', 'r') as file:

reader = csv.reader(file)

for row in reader:

print(row)

**Excel:**

import pandas as pd

df = pd.read\_excel("data.xlsx") # Uses openpyxl engine by default

**📤 3. Writing Files**

**CSV:**

with open('output.csv', 'w', newline='') as file:

writer = csv.writer(file)

writer.writerow(['Name', 'Age'])

writer.writerow(['Alice', 30])

**Excel:**

df.to\_excel("output.xlsx", index=False) # With pandas and openpyxl/xlsxwriter

**🧠 4. Key Operations & Algorithms**

| **Task** | **Tool/Function** |
| --- | --- |
| Filter/Sort | df.query(), df.sort\_values() |
| Grouping | df.groupby() |
| Pivot Tables | df.pivot\_table() |
| Aggregations | df.agg(), df.mean(), df.sum() |
| Apply functions | df.apply(), df.map() |
| Merge/Join | pd.merge(), df.join() |
| Handle Missing | df.fillna(), df.dropna() |
| Data cleaning | Regex with str.replace(), df.replace() |
| Cell formatting | openpyxl.styles, xlsxwriter formatting |
| Formulas | openpyxl.cell.formula, xlsxwriter.write\_formula() |

**🧪 5. Example: Excel Formula Writing with openpyxl**

from openpyxl import Workbook

wb = Workbook()

ws = wb.active

ws['A1'] = 10

ws['A2'] = 20

ws['A3'] = "=SUM(A1:A2)" # Excel formula

wb.save("formula\_example.xlsx")

**🎨 6. Styling Excel Cells**

from openpyxl.styles import Font, PatternFill

ws['A1'].font = Font(bold=True, color="FFFFFF")

ws['A1'].fill = PatternFill(start\_color="000000", end\_color="000000", fill\_type="solid")

**🔄 7. Batch Processing Multiple Files**

import glob

for file in glob.glob("data\_folder/\*.xlsx"):

df = pd.read\_excel(file)

# apply your transformation

**🛠️ 8. Advanced Tools for Automation & Integration**

| **Tool** | **Purpose** |
| --- | --- |
| xlwings | Control Excel app, run macros (Excel automation) |
| openpyxl | Programmatic Excel workbook creation/modification |
| pandas | Powerful analytics and transformations |
| dask | Handle large CSV/Excel files (beyond memory) |
| formulas | Evaluate Excel-like formulas in Python (no Excel needed) |

**📚 9. Learning Resources**

* [Pandas Official Docs](https://pandas.pydata.org/)
* [openpyxl Documentation](https://openpyxl.readthedocs.io/)
* [xlsxwriter Docs](https://xlsxwriter.readthedocs.io/)
* [xlwings Docs](https://docs.xlwings.org/)
* Practice Datasets: Kaggle, Data.gov, FiveThirtyEight, UCI ML Repository

**🧩 10. Use Case Ideas to Practice**

* 📈 Sales Dashboard: read monthly CSVs, aggregate data, write Excel report with charts
* 🧾 Budget Tracker: formulas + styles in Excel using openpyxl
* 🔄 CSV to Excel Converter: with filters, summaries, and highlights
* 📊 Student Score Analyzer: import scores, calculate grades, and export styled report

Would you like a **ready-to-use template or script** for one of these use cases (e.g., dashboard, converter, analyzer)?