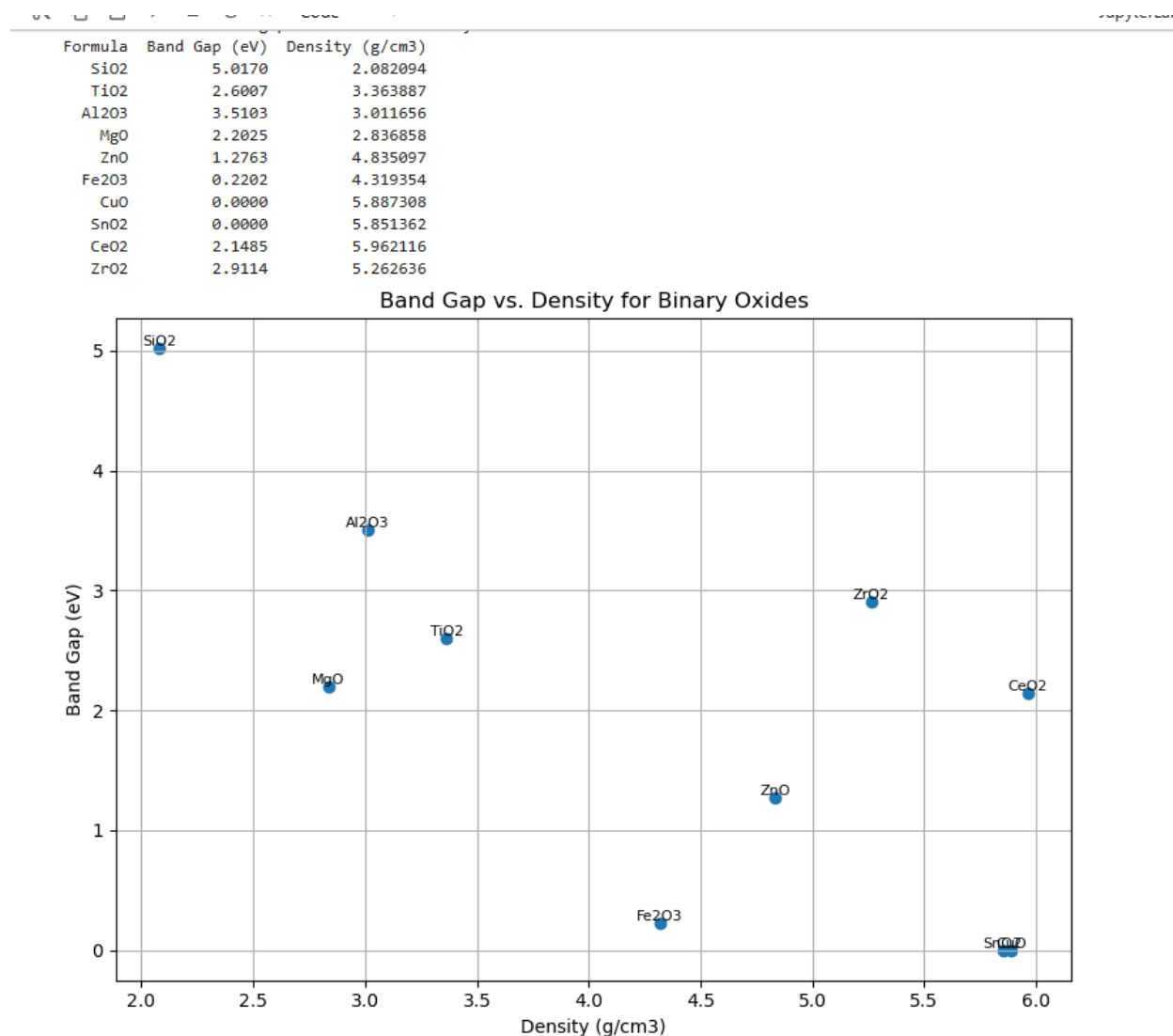**Program 1**

Pandas, matplotlib, and my_api.client creates and manipulates the data and helps it interact with materials project api and then create the plot

Get_oxide_data takes the chemical formulas for the oxides and connects it to the materials project api using the api key, retrieves the band gap and density and returns it in a list

The main function then goes through the list and calls the get_oxide_data to retrieve the data for each oxide, stores the data in a list, converts it into a pandas DataFrame, then creates a scatterplot using matplotlib, adding labels and a title

Formula	Band Gap (eV)	Density (g/cm3)
SiO2	5.0170	2.082094
TiO2	2.6007	3.363887
Al2O3	3.5103	3.011656
MgO	2.2025	2.836858
ZnO	1.2763	4.835097
Fe2O3	0.2202	4.319354
CuO	0.0000	5.887308
SnO2	0.0000	5.851362
CeO2	2.1485	5.962116
ZrO2	2.9114	5.262636

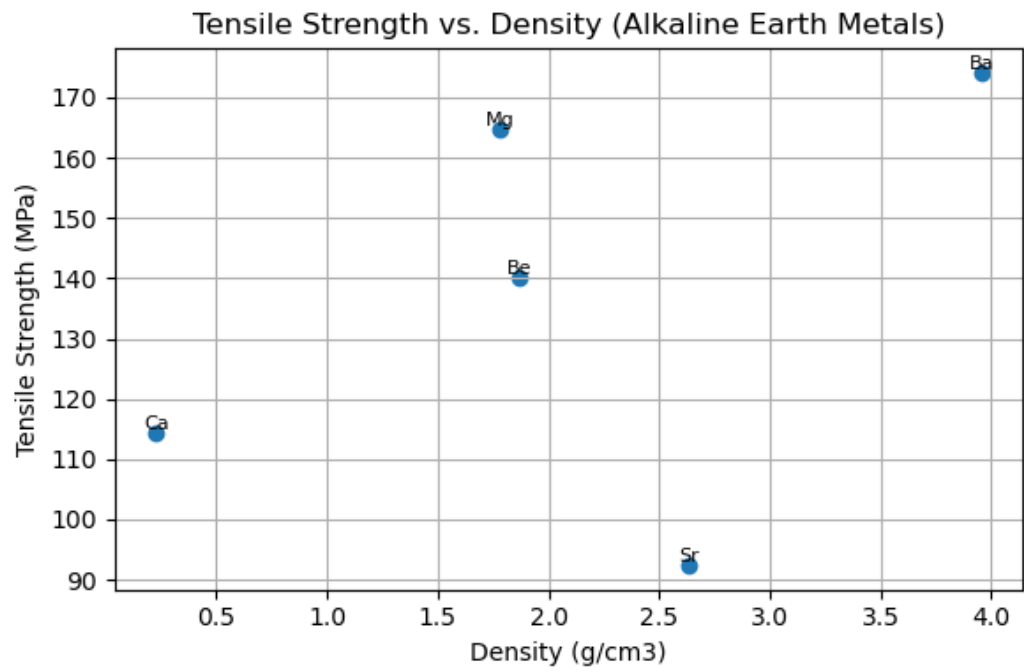Band Gap vs. Density for Binary Oxides

Program 2

Imports pandas, matplotlib.pyplot, and my_api.client.MPRester to create and manipulate the data into the table.

The get_material_data takes the chemical formula as input, connects it to the materials project api using api key, retrieves the density and tensile strength of the material from the api

Plot_tensile_strength vs material function takes the list and converts it into a pandas DataFrame, then creates a scatter plot using matplotlib and plots density on the x axis and tensile strength on the y axis, adds labels, titles, etc. and displays it

The main function defines the list of alkaline earth metals, goes through the list to retrieve the data for each one, stores it in a list, then calls it back to generate and display the plot.

```
   Formula  Density (g/cm3)  Tensile Strength (MPa)
0      Be         1.869116              140.134292
1      Mg         1.782330              164.596341
2      Ca         0.227628              114.454997
3      Sr         2.633254               92.430065
4      Ba         3.953586              174.010567
```


Tensile Strength vs. Density (Alkaline Earth Metals)

[ ]: