

Create Spreadsheet

Create a professional spreadsheet for Value at Risk Analysis

	A	B	C	D	E	F	G
1	Portfolio Holdings						
2	Five-name equity book Shares are inputs; market value & weights are live						
4							
5							
6	Ticker	Company	Sector	Shares	Last Price	Market Value	Weight
7	XOM	Exxon Mobil Corp.	Energy	13,180	\$151.75	\$2,000,065	20.00%
8	JPM	JPMorgan Chase & Co.	Financials	8,036	\$311.11	\$2,500,080	25.00%
9	NVDA	NVIDIA Corp.	Information Technology	7,189	\$208.64	\$1,499,913	15.00%
10	KO	Coca-Cola Co.	Consumer Staples	25,145	\$79.54	\$2,000,033	20.00%
11	CAT	Caterpillar Inc.	Industrials	2,184	\$915.64	\$1,999,758	20.00%
12	TOTAL					\$9,999,849	100.00%
13							

Create a professional spreadsheet for Value at Risk Analysis

A	B	C	D	E	F	G
1	Value-at-Risk Analysis					
2	Parametric · Historical Simulation · Diversification · Correlation 1-day & 10-day horizons					
4						
5	1 Key Inputs & Portfolio Return Statistics (Daily)					
6	Portfolio Market Value	\$9,999,849				
7	Number of Return Observations	99				
8	Mean Daily Return	0.166%				
9	Daily Volatility (σ)	0.955%				
10	Annualised Volatility	15.16%				
11	Minimum Daily Return	-1.96%				
12	Maximum Daily Return	4.12%				
13	Skewness	0.7181				
14	Excess Kurtosis	2.2284				
15						
16	2 Value-at-Risk & Expected Shortfall Summary					
17	Methodology / Confidence	z-score	VaR % (1-Day)	VaR \$ (1-Day)	VaR \$ (10-Day)	Exp. Shortfall \$ (1-Day)
18	Parametric — 95% confidence	1.645	1.40%	\$140,470	\$444,204	\$180,378
19	Parametric — 99% confidence	2.326	2.06%	\$205,558	\$650,030	\$237,922
20	Historical Simulation — 95% confidence	—	1.30%	\$130,495	\$412,662	\$156,675
21	Historical Simulation — 99% confidence	—	1.59%	\$158,757	\$502,033	\$195,666
22						

Create a professional spreadsheet for Value at Risk Analysis

23

3 | Diversification Analysis (Parametric, 95%, 1-Day)

24

Asset	Weight	Daily σ	Standalone VaR \$	% of Undiversified
XOM	20.00%	1.841%	\$60,554	19.89%
JPM	25.00%	1.477%	\$60,737	19.95%
NVDA	15.00%	2.507%	\$61,856	20.32%
KO	20.00%	1.141%	\$37,552	12.34%
CAT	20.00%	2.545%	\$83,704	27.50%
Sum of Standalone VaRs (Undiversified)			\$304,402	
Diversified Portfolio VaR (Parametric 95%)			\$140,470	
Diversification Benefit (\$)			\$163,932	
Diversification Benefit (%)			53.85%	

34

35

4 | Correlation Matrix — Daily Returns

36

	XOM	JPM	NVDA	KO	CAT
XOM	1.00	-0.18	-0.16	0.12	-0.15
JPM	-0.18	1.00	0.22	-0.09	0.48
NVDA	-0.16	0.22	1.00	-0.20	0.31
KO	0.12	-0.09	-0.20	1.00	0.02
CAT	-0.15	0.48	0.31	0.02	1.00

42

VS Code and Claude Code

- Ensure that you have installed VS Code, and added the Claude Code extension
- Follow the instructions from previous slides to ensure you have access

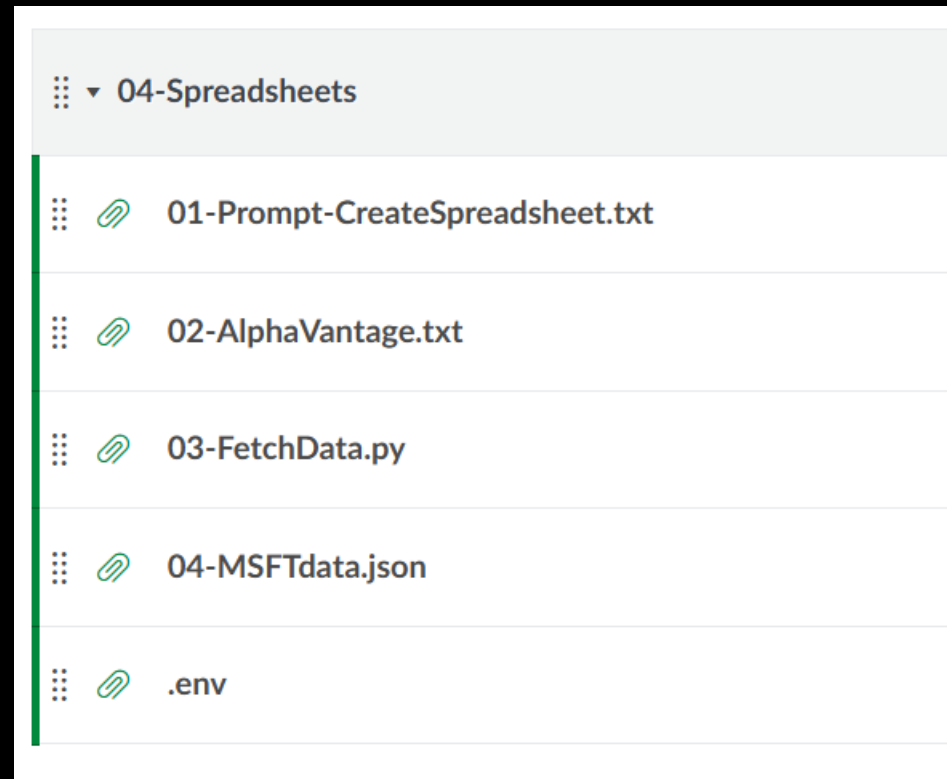
Python

- For this task you also need to have Python installed on your PC
- Download from <https://www.python.org>

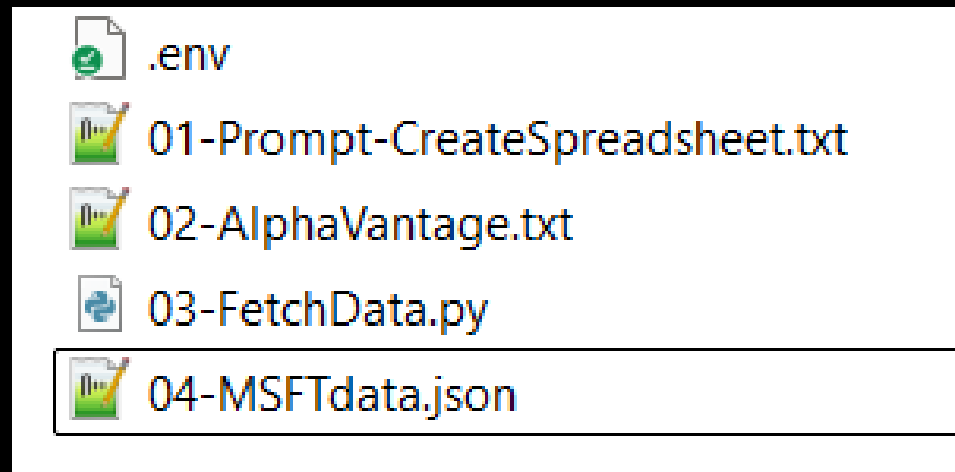
AlphaVantage

- We will access company and market data from AlphaVantage using their API
- Register for a free API key at:
<https://www.alphavantage.co/support/#api-key>
- Copy it to the .env file

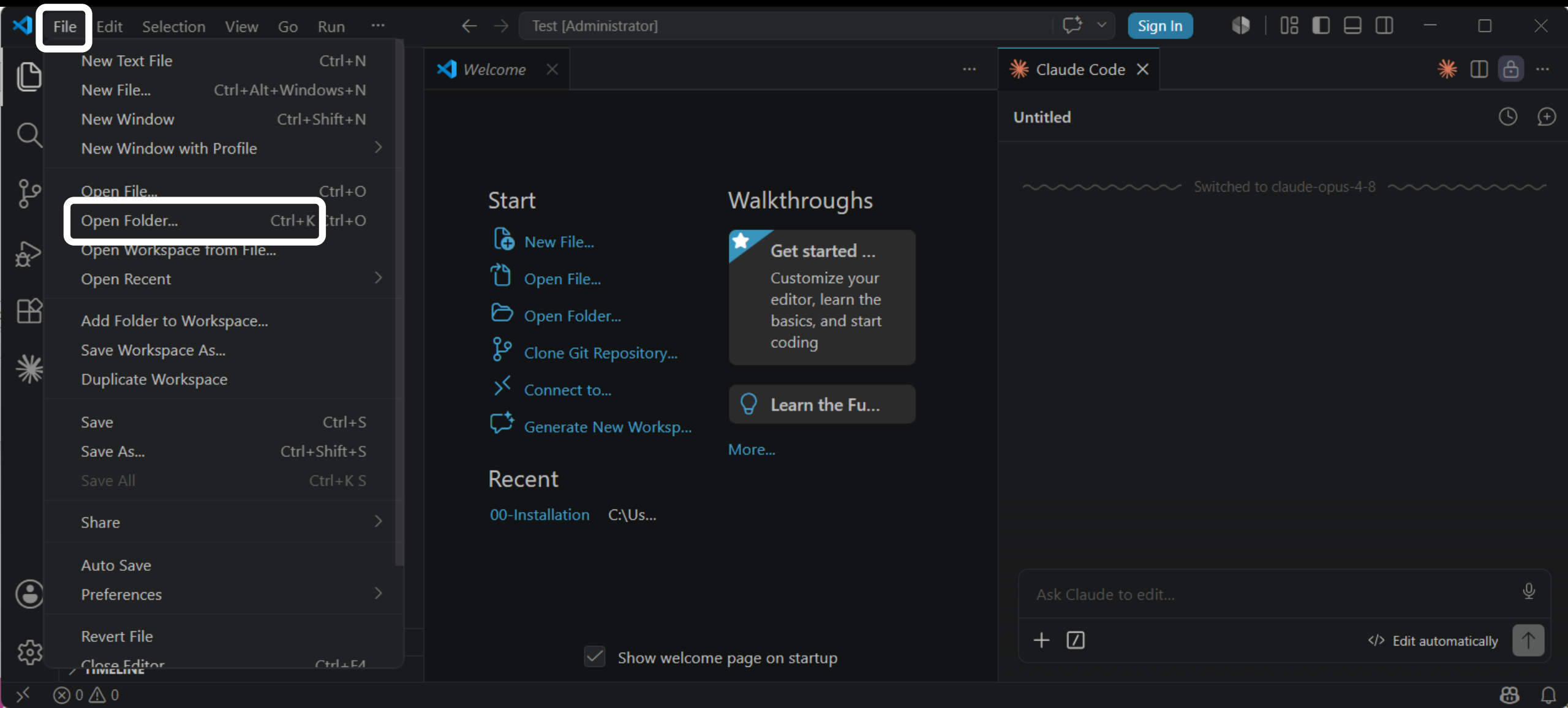
Download the files from the 04-Spreadsheets section on Canvas



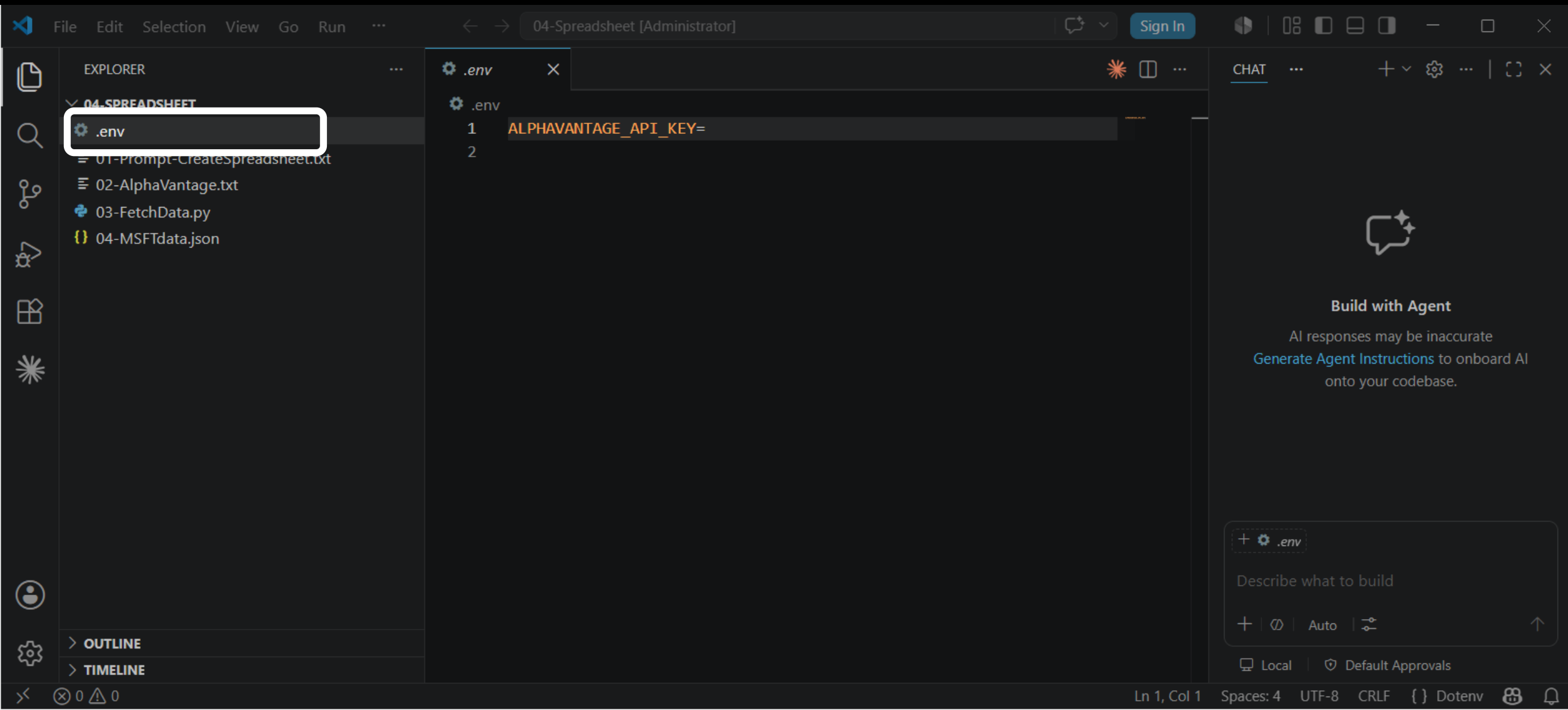
Save the files to a folder on your PC



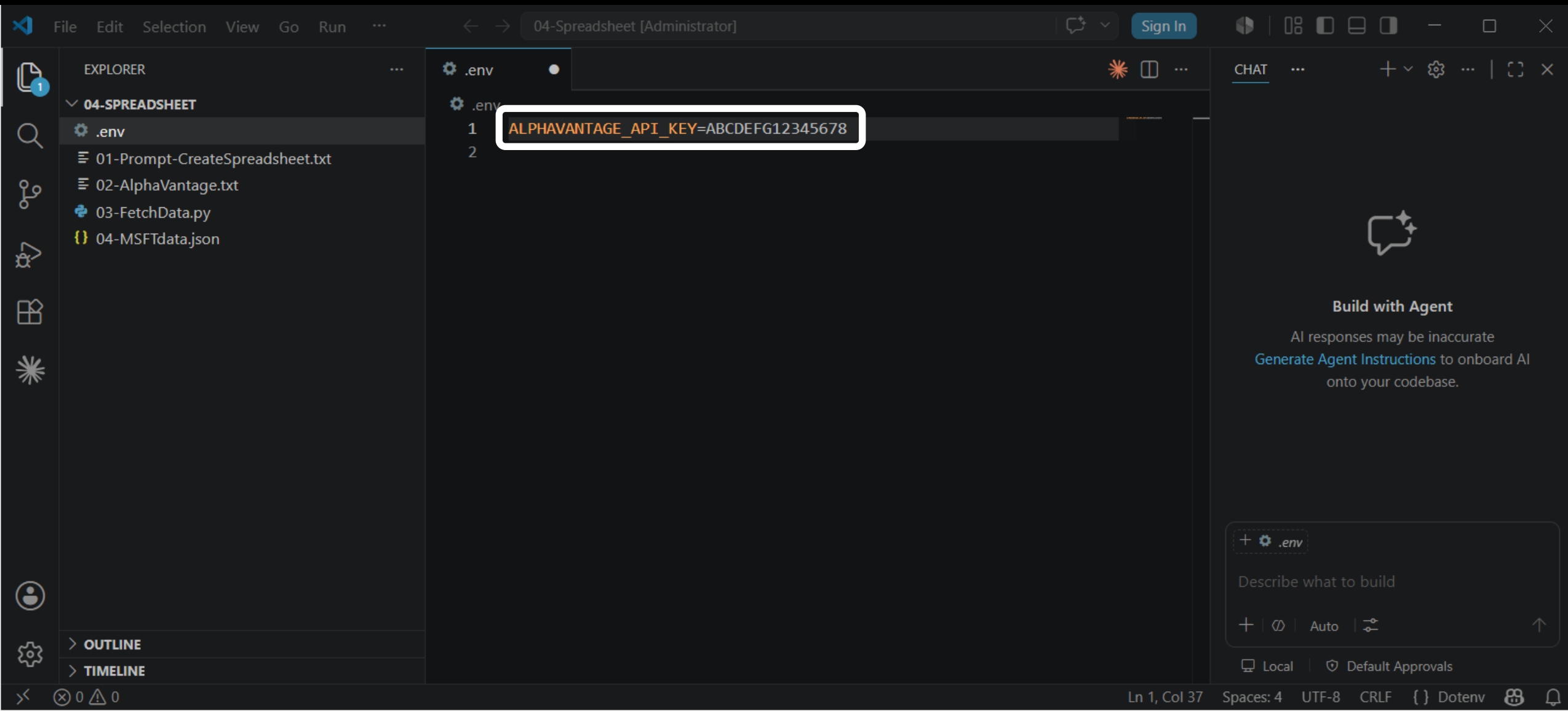
In VS Code, click File -> Open Folder Select the folder containing those files



Click on env-template.txt



Copy and paste the API key from AlphaVantage



The screenshot shows the Visual Studio Code interface with a project named "04-Spreadsheet [Administrator]". The Explorer panel on the left shows a folder named "04-SPREADSHEET" containing several files: ".env", "01-Prompt-CreateSpreadsheet.txt", "02-AlphaVantage.txt", "03-FetchData.py", and "04-MSFTdata.json". The ".env" file is selected and its contents are displayed in the editor. The file contains two lines: "1 ALPHAVANTAGE_API_KEY=ABCDEF12345678" and "2". The first line is highlighted with a white box. The right sidebar shows the "CHAT" panel with a "Build with Agent" section, which includes a warning that "AI responses may be inaccurate" and a link to "Generate Agent Instructions". At the bottom of the sidebar, there is a section for ".env" files with a "Describe what to build" input field and buttons for "Local" and "Default Approvals". The status bar at the bottom indicates the current position is "Ln 1, Col 37" and the encoding is "UTF-8".

File Edit Selection View Go Run ... 04-Spreadsheet [Administrator] Sign In

EXPLORER

04-SPREADSHEET

- .env
- 01-Prompt-CreateSpreadsheet.txt
- 02-AlphaVantage.txt
- 03-FetchData.py
- 04-MSFTdata.json

.env

```
1 ALPHAVANTAGE_API_KEY=ABCDEF12345678
2
```

CHAT

Build with Agent

AI responses may be inaccurate

[Generate Agent Instructions](#) to onboard AI onto your codebase.

+ .env

Describe what to build

+ | | Auto | |

Local | Default Approvals

Ln 1, Col 37 Spaces: 4 UTF-8 CRLF { } Dotenv

Click on 01-Prompt-CreateSpreadsheet.txt

The screenshot shows a code editor interface with a dark theme. The top bar includes a menu (File, Edit, Selection, View, Go, Run), a search bar, and a "Sign In" button. The left sidebar contains an "EXPLORER" panel with a tree view of files under the folder "04-SPREADSHEET VALUE AT RISK". The files listed are "01-Prompt-CreateSpreadsheet.txt", "02-AlphaVantage.txt", "03-FetchData.py", and "04-MSFTdata.json". The "01-Prompt-CreateSpreadsheet.txt" file is selected and highlighted with a white border. The main editor area displays the content of this file, which includes requirements for running a script, instructions for installing Python and packages, and a task description. The right sidebar contains a "CHAT" panel with a "Build with Agent" section, a warning about AI response accuracy, and a "Generate Agent Instructions" button. Below this is a text input field with a placeholder "Describe what to build" and a "Send" button. The bottom status bar shows the current line and column (Ln 1, Col 1), spacing (Spaces: 3), encoding (UTF-8), line endings (CRLF), and the file type (Plain Text).

File Edit Selection View Go Run ... 04-Spreadsheet Value at Risk [Administrator] Sign In

EXPLORER

04-SPREADSHEET VALUE AT RISK

- 01-Prompt-CreateSpreadsheet.txt
- 02-AlphaVantage.txt
- 03-FetchData.py
- 04-MSFTdata.json

01-Prompt-CreateSpreadsheet.txt

```
1 =====
2 REQUIREMENTS - Please ensure before running:
3 =====
4 1. PYTHON: Install Python 3.x from https://www.python.org/
5   downloads/
6   - Check "Add Python to PATH" during installation
7
8 2. PACKAGES: Run in terminal:
9   pip install requests python-dotenv
10
11 3. API KEY: Get an Alpha Vantage API key from https://www.
12   alphavantage.co/support/#api-key
13   - Free tier available (5 calls/minute)
14   - Add it to the .env file in the root folder:
15   ALPHAVANTAGE_API_KEY=your_key_here
16 =====
17 Use the xlsx skill at https://github.com/anthropics/skills/
18   tree/main/skills/xlsx
19
20 TASK 1
21 Create an Excel spreadsheet for an Investment Bank which
22 analyses Value at Risk of a portfolio which has 5 stocks
23 which you choose at random.
```

CHAT CLAUDE CODE

Build with Agent

AI responses may be inaccurate

Generate Agent Instructions to onboard AI onto your codebase.

+ 01-Prompt-CreateSpreadsheet.txt

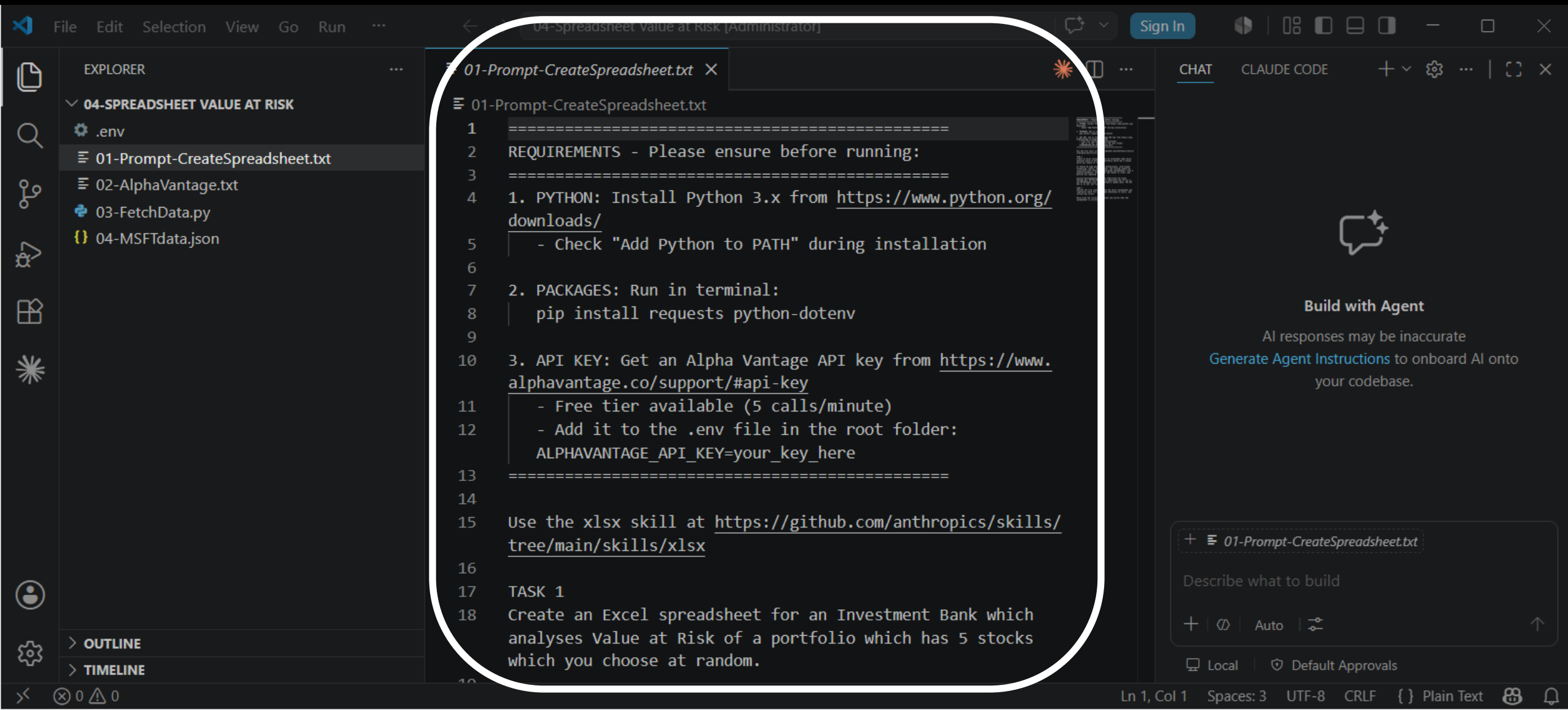
Describe what to build

+ | | Auto |

Local | Default Approvals

Ln 1, Col 1 Spaces: 3 UTF-8 CRLF {} Plain Text

Read through the prompt



The screenshot shows a code editor interface with a file explorer on the left and a chat panel on the right. The file explorer shows a project named "04-SPREADSHEET VALUE AT RISK" with files: ".env", "01-Prompt-CreateSpreadsheet.txt", "02-AlphaVantage.txt", "03-FetchData.py", and "04-MSFTdata.json". The chat panel shows a "Build with Agent" section with a warning that AI responses may be inaccurate and a button to "Generate Agent Instructions".

The prompt text, highlighted by a white rounded rectangle, is as follows:

```
1 =====
2 REQUIREMENTS - Please ensure before running:
3 =====
4 1. PYTHON: Install Python 3.x from https://www.python.org/downloads/
5   - Check "Add Python to PATH" during installation
6
7 2. PACKAGES: Run in terminal:
8   pip install requests python-dotenv
9
10 3. API KEY: Get an Alpha Vantage API key from https://www.alphavantage.co/support/#api-key
11   - Free tier available (5 calls/minute)
12   - Add it to the .env file in the root folder:
13     ALPHAVANTAGE_API_KEY=your_key_here
14
15 Use the xlsx skill at https://github.com/anthropics/skills/tree/main/skills/xlsx
16
17 TASK 1
18 Create an Excel spreadsheet for an Investment Bank which
19 analyses Value at Risk of a portfolio which has 5 stocks
20 which you choose at random.
```

The status bar at the bottom indicates: Ln 1, Col 1 Spaces: 3 UTF-8 CRLF {} Plain Text

Explanation of prompt

- Begins with a summary of installation requirements
- Asks Claude to create a spreadsheet to calculate Value at Risk for a portfolio
- Use the XLSX skill for standard guidelines on formatting
- Gives detailed references on how the data available from AlphaVantage is structured
- Asks for checks after the spreadsheet is created

Click orange icon to open Claude Code

File Edit Selection View Go Run ... 04-Spreadsheet Value at Risk [Administrator] Sign In

EXPLORER

- 04-SPREADSHEET VALUE AT RISK
 - .env
 - 01-Prompt-CreateSpreadsheet.txt
 - 02-AlphaVantage.txt
 - 03-FetchData.py
 - 04-MSFTdata.json

01-Prompt-CreateSpreadsheet.txt

```
1 =====
2 REQUIREMENTS - Please ensure before running:
3 =====
4 1. PYTHON: Install Python 3.x from https://www.python.org/
   downloads/
5   - Check "Add Python to PATH" during installation
6
7 2. PACKAGES: Run in terminal:
8   pip install requests python-dotenv
9
10 3. API KEY: Get an Alpha Vantage API key from https://www.
   alphavantage.co/support/#api-key
11   - Free tier available (5 calls/minute)
12   - Add it to the .env file in the root folder:
   ALPHAVANTAGE_API_KEY=your_key_here
13 =====
14
15 Use the xlsx skill at https://github.com/anthropics/skills/
   tree/main/skills/xlsx
16
17 TASK 1
18 Create an Excel spreadsheet for an Investment Bank which
   analyses Value at Risk of a portfolio which has 5 stocks
   which you choose at random.
```

CHAT CLAUDE CODE

Build with Agent

AI responses may be inaccurate

Generate Agent Instructions to onboard AI onto your codebase.

+ 01-Prompt-CreateSpreadsheet.txt

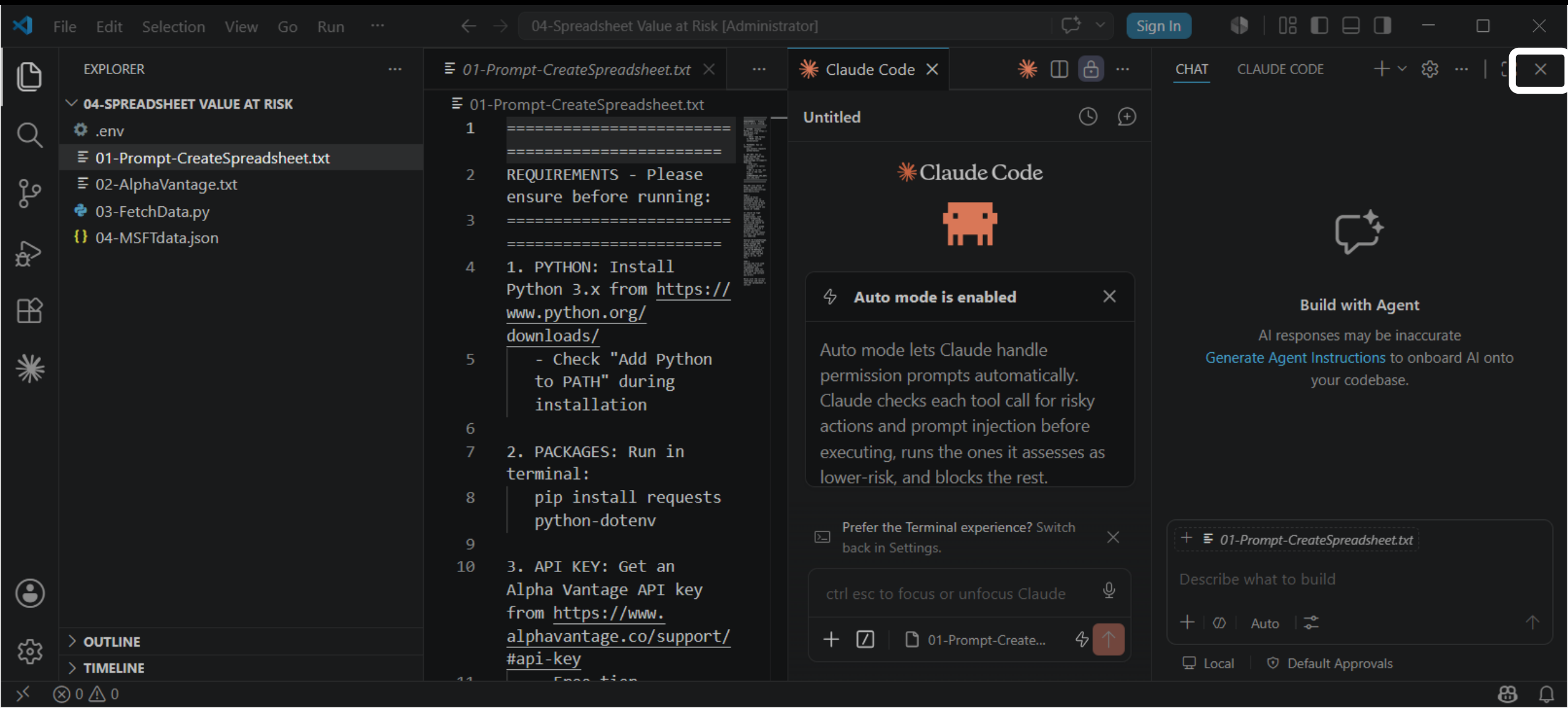
Describe what to build

+ | | Auto |

Local | Default Approvals

Ln 1, Col 1 Spaces: 3 UTF-8 CRLF {} Plain Text

Close the other chat window



Ensure Settings use Model=Fable, Effort=Medium, and Auto Mode

The screenshot shows the VS Code interface with the Claude Code extension. The Explorer sidebar on the left shows a project named "04-SPREADSHEET VALUE AT RISK" with files: .env, 01-Prompt-CreateSpreadsheet.txt, 02-AlphaVantage.txt, 03-FetchData.py, and 04-MSFTdata.json. The main editor displays the content of 01-Prompt-CreateSpreadsheet.txt, which includes requirements for Python, packages, and API keys, followed by a task instruction to create an Excel spreadsheet.

```
01-Prompt-CreateSpreadsheet.txt
1 =====
2 REQUIREMENTS - Please ensure before running:
3 =====
4 1. PYTHON: Install Python 3.x from https://www.python.org/downloads/
5    - Check "Add Python to PATH" during installation
6
7 2. PACKAGES: Run in terminal:
8    pip install requests python-dotenv
9
10 3. API KEY: Get an Alpha Vantage API key from https://www.alphavantage.co/support/#api-key
11    - Free tier available (5 calls/minute)
12    - Add it to the .env file in the root folder:
13      ALPHAVANTAGE_API_KEY=your_key_here
14
15 Use the xlsx skill at https://github.com/anthropics/skills/tree/main/skills/xlsx
16
17 TASK 1
18 Create an Excel spreadsheet for an Investment Bank which analyses Value at Risk of a portfolio which has 5 stocks which you choose at random
```

The Claude Code sidebar on the right shows the "Claude Code" header with the robot icon. A notification states "Auto mode is enabled" and explains that auto mode handles permission prompts automatically. At the bottom, a task bar shows a plus icon, a document icon, the file name "01-Prompt-CreateSpreadsheet...", and a button labeled "Auto mo..." with a lightning bolt icon. The "Auto mo..." button is highlighted with a white box.

Ask Claude Code: implement 01-Prompt-CreateSpreadsheet.txt

The screenshot displays the Claude Code IDE interface. On the left, the **EXPLORER** panel shows a project named **04-SPREADSHEET VALUE AT RISK** with files: `.env`, `01-Prompt-CreateSpreadsheet.txt` (selected), `02-AlphaVantage.txt`, `03-FetchData.py`, and `04-MSFTdata.json`. The **01-Prompt-CreateSpreadsheet.txt** file is open in the editor, containing the following text:

```
1 =====
2 REQUIREMENTS - Please ensure before running:
3 =====
4 1. PYTHON: Install Python 3.x from https://www.
python.org/downloads/
5 - Check "Add Python to PATH" during
installation
6
7 2. PACKAGES: Run in terminal:
8 pip install requests python-dotenv
9
10 3. API KEY: Get an Alpha Vantage API key from
https://www.alphavantage.co/support/#api-key
11 - Free tier available (5 calls/minute)
12 - Add it to the .env file in the root folder:
ALPHAVANTAGE_API_KEY=your_key_here
13 =====
14
15 Use the xlsx skill at https://github.com/
anthropics/skills/tree/main/skills/xlsx
16
17 TASK 1
18 Create an Excel spreadsheet for an Investment
Bank which analyses Value at Risk of a portfolio
which has 5 stocks which you choose at random
```

On the right, the **Claude Code** chat window is open, showing the **Untitled** document. A notification states: **Auto mode is enabled**. Below this, a message explains: "Auto mode lets Claude handle permission prompts automatically. Claude checks each tool call for risky actions and prompt injection before executing, runs the ones it assesses as lower-risk, and blocks the rest." A **Learn more** link is provided. At the bottom of the chat window, the input field contains the text `implement 01-Prompt-CreateSpreadsheet.txt`, and the **Send** button (a red square with a white upward arrow) is highlighted.

It will produce an Excel file

The screenshot shows a code editor with a file explorer on the left, a central editor window, and a right-hand panel. The file explorer shows a project named '04-SPREADSHEET VAR' with files like '.env', '~\$Portfolio_VaR_Analysis.xlsx', '01-Prompt-CreateSpreadsheet.txt', '02-AlphaVantage.txt', '03-FetchData.py', '04-MSFTdata.json', 'aapl_data.json', 'AAPL_DCF_Model.xlsx', 'build_dcf.py', 'build_var.py', 'fetch_aapl.py', 'fetch_var_data.py', 'Portfolio_VaR_Analysis.xlsx', 'recalc.py', 'var_data.json', and 'verify_var.py'. The central editor window shows the content of '01-Prompt-CreateSpreadsheet.txt'. The right-hand panel shows the output of the prompt, which includes a command to run the script and a confirmation message.

File Edit Selection View Go Run ... 04-Spreadsheet VaR [Administrator] Sign In

EXPLORER

- 04-SPREADSHEET VAR
 - .env
 - ~\$Portfolio_VaR_Analysis.xlsx
 - 01-Prompt-CreateSpreadsheet.txt
 - 02-AlphaVantage.txt
 - 03-FetchData.py
 - 04-MSFTdata.json
 - aapl_data.json
 - AAPL_DCF_Model.xlsx
 - build_dcf.py
 - build_var.py
 - fetch_aapl.py
 - fetch_var_data.py
 - Portfolio_VaR_Analysis.xlsx
 - recalc.py
 - var_data.json
 - verify_var.py

01-Prompt-CreateSpreadsheet.txt

```
1 =====
2 REQUIREMENTS - Please ensure before running:
3 =====
4 1. PYTHON: Install Python 3.x from https://www.
5 python.org/downloads/
6 - Check "Add Python to PATH" during
7 installation
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9 2. PACKAGES: Run in terminal:
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17 =====
18 Use the xlsx skill at https://github.com/
19 anthropics/skills/tree/main/skills/xlsx
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21 TASK 1
22 Create an Excel spreadsheet for an Investment
23 Bank which analyses Value at Risk of a portfolio
24 which has 5 stocks which you choose at random
```

Implement spreadsheet creation prompt

</> c:\Users\3044512\My Drive (...)

implement 01-Prompt-CreateSpreadsheet.txt

- Both tasks are complete and verified.

What was built

Portfolio_VaR_Analysis.xlsx — an investment-bank-grade Value-at-Risk workbook for a randomly selected 5-name equity book (~\$10m):

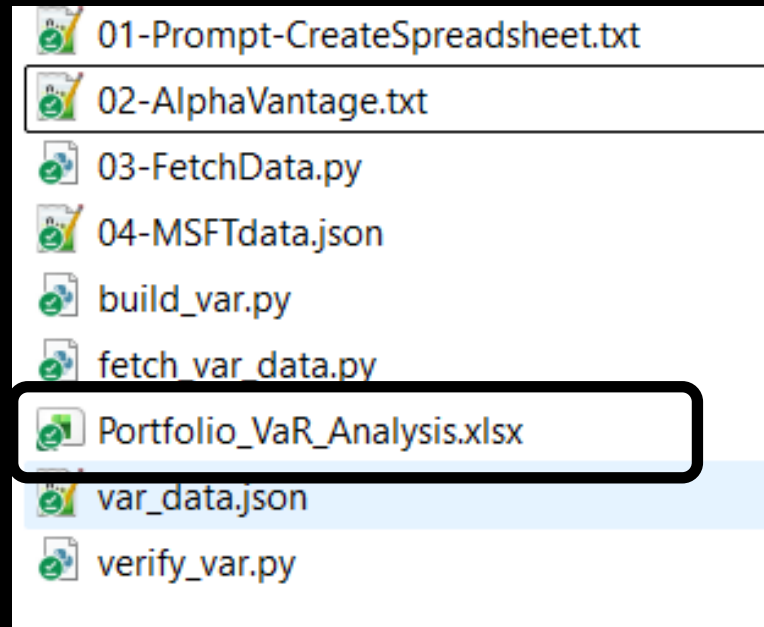
Ticker	Company	Sector	Weight
XOM	Exxon Mobil	Energy	20.0%
JPM	JPMorgan Chase	Financials	25.0%
NVDA	NVIDIA	Information Tech	15.0%
KO	Coca-Cola	Consumer Staples	20.0%

ctrl+... to focus or unfocus Claude

+ [] 01-Prompt-CreateSpreadsheet... ⚡ Auto mo... ⬆

Ln 1, Col 48 Spaces: 3 UTF-8 CRLF {} Plain Text

In Windows File Explorer (not VS Code)
double-click the .xlsx file



Value at Risk Analysis

	A	B	C	D	E	F	G
1	Portfolio Holdings						
2	Five-name equity book Shares are inputs; market value & weights are live						
4							
5							
6	Ticker	Company	Sector	Shares	Last Price	Market Value	Weight
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12	TOTAL					\$9,999,849	100.00%
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Value at Risk Analysis

	A	B	C	D	E	F	G
1	Value-at-Risk Analysis						
2	Parametric · Historical Simulation · Diversification · Correlation 1-day & 10-day horizons						
4							
5	1 Key Inputs & Portfolio Return Statistics (Daily)						
6	Portfolio Market Value	\$9,999,849					
7	Number of Return Observations	99					
8	Mean Daily Return	0.166%					
9	Daily Volatility (σ)	0.955%					
10	Annualised Volatility	15.16%					
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14	Excess Kurtosis	2.2284					
15							
16	2 Value-at-Risk & Expected Shortfall Summary						
17	Methodology / Confidence	z-score	VaR % (1-Day)	VaR \$ (1-Day)	VaR \$ (10-Day)	Exp. Shortfall \$ (1-Day)	
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22							

Value at Risk Analysis

3 | Diversification Analysis (Parametric, 95%, 1-Day)

Asset	Weight	Daily σ	Standalone VaR \$	% of Undiversified
XOM	20.00%	1.841%	\$60,554	19.89%
JPM	25.00%	1.477%	\$60,737	19.95%
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CAT	20.00%	2.545%	\$83,704	27.50%
Sum of Standalone VaRs (Undiversified)			\$304,402	
Diversified Portfolio VaR (Parametric 95%)			\$140,470	
Diversification Benefit (\$)			\$163,932	
Diversification Benefit (%)			53.85%	

4 | Correlation Matrix — Daily Returns

	XOM	JPM	NVDA	KO	CAT
XOM	1.00	-0.18	-0.16	0.12	-0.15
JPM	-0.18	1.00	0.22	-0.09	0.48
NVDA	-0.16	0.22	1.00	-0.20	0.31
KO	0.12	-0.09	-0.20	1.00	0.02
CAT	-0.15	0.48	0.31	0.02	1.00

Challenge

- Create a spreadsheet with a Value at Risk analysis for a different set of stocks
- Upload to Canvas for the assignment