Spreadsheets and AI

MGMT 675: Generative AI for Finance

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AI Can Create Spreadsheets with Python

- Python libraries like `openpyxl` create/modify Excel files
- AI writes Python code that:
  - Inserts data values into cells
  - Writes Excel formulas (e.g., `=SUM(A1:A10)`)
  - Applies formatting (fonts, colors, borders)
  - Creates charts and pivot tables
- Result: fully functional spreadsheet with **live formulas**

Formulas vs. Hardcoded Values

Hardcoded (Bad)

```
sheet['B10'] = 1500
```

Cell shows 1500, but if inputs change, the total doesn't update.

Formula (Good)

```
sheet['B10'] = '=SUM(B2:B9)'
```

Cell contains a formula that recalculates when inputs change.

AI must be instructed to use formulas, not compute values in Python

Claude Skills for Excel

- Claude Code can use "skills"—instructions for specific tasks
- The `xlsx` skill instructs Claude to:
  - Use Excel formulas instead of hardcoded values
  - Apply professional formatting (color coding, number formats)
  - Verify zero formula errors (#REF!, #DIV/0!, etc.)
  - Follow financial modeling standards
- Skills ensure consistent, high-quality output
- View the full xlsx skill documentation

Two Ways AI Interacts with Spreadsheets

Inside Excel (Add-ins)

- Sidebar panel in Excel
- Sees your current workbook
- Modifies cells directly
- Context-aware suggestions
- Examples: Claude for Excel, Microsoft Copilot

Outside Excel (Python)

- Runs in terminal or IDE
- Creates/modifies .xlsx files
- You open result in Excel
- Full programming power
- Examples: Claude Code, ChatGPT

Microsoft Copilot in Excel

- **Formula mode:** Suggests Excel formulas (XLOOKUP, SUMIF, etc.)
- **Python mode:** Runs Python in Microsoft Cloud (Anaconda libraries)
- Tightly integrated—sees your data context automatically
- Requires OneDrive/SharePoint (auto-save must be enabled)
- **Requires Microsoft 365 Copilot license ($30/user/month)**

Claude for Excel Add-in

- Runs Python in a server-side sandbox
- Reads multi-tab workbooks, explains calculations
- Modifies cells while preserving formula dependencies
- **Does not require OneDrive**—works with local files
- Available on Claude Pro, Max, Team, and Enterprise plans
- Free tier available with usage limits

Copilot vs. Claude: Key Differences

Feature	Microsoft Copilot	Claude for Excel
Integration	Native (built into Excel)	Add-in (sidebar)
Languages	Excel formulas + Python	Python
Cloud requirement	OneDrive/SharePoint	None
Context awareness	Automatic	Reads workbook
Speed	Slower	Faster responses
Alternatives shown	Limited	Multiple options
Cost	$30/user/month	Free tier available

Use Copilot for quick in-place edits; Claude for complex analysis

Claude for Excel

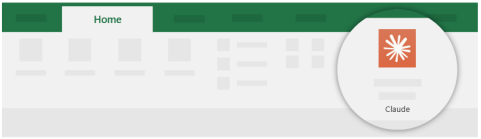
Claude Add-In for Excel

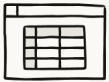
Launch and Log In

Launch the add-in

After you install the add-in, you can launch it by choosing the add-in button on the Home tab

On the Home tab





Claude, right in your workbooks

Analyze sheets, update assumptions, debug errors—with citations and transparency.

Log in

Get Started

1. Ask Claude to create an example two-stage DCF analysis
2. Open any spreadsheet, click the Claude icon at top right, ask Claude to do things

Exercise: Computing Returns

- Download the Excel file containing NOV price and dividend history
- Compute daily returns including dividends
- Calculate annualized mean return and volatility

Download exercise1-returns.xlsx

Exercise: Aggregating Spreadsheets

- Download the zip file containing five regional sales spreadsheets
- Each file has similar but not identical column layouts
- Reconcile column names and aggregate into a single table

Download exercise2-aggregation.zip

Exercise: Computing Financial Ratios

- Download the Excel file containing NOV financial statements
- Income statement, balance sheet, and cash flow statement
- Compute key financial ratios and analyze trends

Download exercise3-statements.xlsx