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

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

- **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
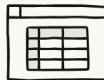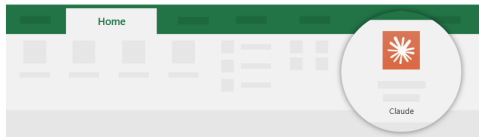- Free tier available with usage limits

Claude Add-In for Excel

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

1. Open betas.xlsx. Ask Claude to compute WalMart's beta.
2. Open a new workbook. Ask Claude to create an example two-stage DCF analysis

Go to claude.ai or use Claude Desktop

"Create an Excel workbook to illustrate two-stage DCF analysis."

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