Financial Modeling with Python and Excel An Introduction

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Table of Contents

1 Introduction to Financial Modeling

Introduction to the Modeling Toolset

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What is this Class?

 This is a skills-based course focused on teaching financial modeling techniques in Python and Excel

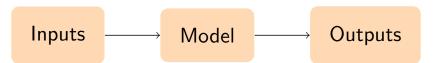
 The focus is not a lot of specific models, but rather general model-building techniques

 The focus will be simple models, but extending them in powerful ways



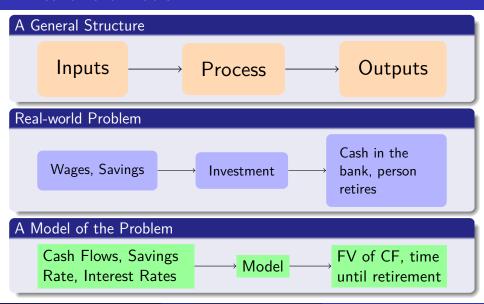


What is a Model?



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 Intro
 September 28, 2020
 4 / 19

A Retirement Problem



Valuing a Company (DCF Model)

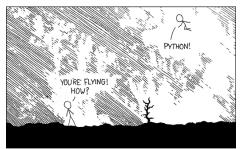


Table of Contents

1 Introduction to Financial Modeling

2 Introduction to the Modeling Toolset

Why Python?





Python is a Good Choice for Finance

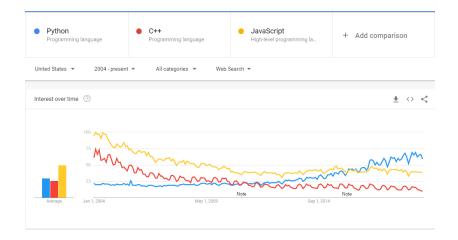
- The easiest to learn mainstream programming language
- Heavily used in the financial industry

Python is the Most Flexible of the Top Languages

- Modeling
- Data science
- Algorithmic Trading
- Scripting

- Devices
- Web Development
- Web Scraping
- Even these slides

Python is the Fastest Growing Programming Lanugage



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More Python Advantages

- Open source completely free and open
- Focus on readability almost pseudo-code
- Take as much as you need. Easy for beginners, many features for experts.
- Deep integrations with Excel VBA replacement, run Python in Excel, run Excel from Python

Why Not use Python?

```
doug@doug: ~
File Edit View Search Terminal Help
doug@doug:~$ python3
Python 3.6.6 (default, Sep 12 2018, 18:26:19)
[GCC 8.0.1 20180414 (experimental) [trunk revision 259383]] on linux
Type_"help", "copyright", "credits" or "license" for more information.
>>>
```

Python Disadvantages

• No graphical interface (by default)

• Hard to get others working with it if they don't know Python

• Can take more work to get started on a project

Why Not use VBA?

```
(General)
  Sub Range Find Method Row()
  'Finds the last non-blank row on a sheet/range.
  Dim 1Row As Long
                                                      What does all this
                                                       code mean???
      On Error Resume Next
      1Row = Cells.Find(What:="*",
                      After:=Range("A1"),
                      LookAt:=xlPart,
                      LookIn:=xlFormulas,
                      SearchOrder:=xlByRows,
                      SearchDirection:=xlPrevious.
                      MatchCase:=False).Row
      On Error GoTo 0
      MsgBox "Last Row: " & 1Row
  End Sub
```

VBA is Old-School

 Code is not as readable as Python

 Power is limited to working within Microsoft Office



 Python has a complete VBA API built into a package -Python can do VBA and more

We Can't Ditch Excel Yet

• Excel is everywhere. Most of the world's data is in Excel spreadsheets

• (Nearly) everyone knows how use it

• You can see what you're doing (without effort)

Easy introspection into a particular value

Escaping Excel Hell



The Pains of Excel

• Code and view are mixed together, code is hidden

• Both cell formulas and VBA macros - What is going on?

• Easy to make mistakes (one cell different)

Some tasks which are very simple in Python are very complex in Excel

Let's Get Python Set Up on your System

Install Steps

- Go to https://www.anaconda.com/products/individual to download Python 3.8
- Follow the steps in the installer
- You will hit "Advanced Installation Options". It is very important that you select "Add Anaconda to my PATH environment variable". It says it is not recommended, and will highlight it in red when checked, but we will need it later in the course.
- 4 Open CMD (windows key, search cmd)
- $oldsymbol{\circ}$ Type python and hit enter. You should see Python 3.8 and a >>> come up.

Make sure you have selected Python 3.8 and not 2.7

Lecture Resources

Lecture Resources

- Syllabus
- Course Schedule
- Slides Financial Modeling with Python and Excel
- Lecture Notes Financial Modeling with Python and Excel