# The Boiler Plate

## Python in Dynamo

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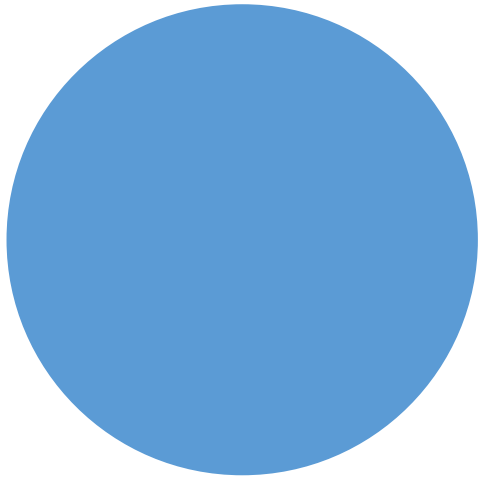
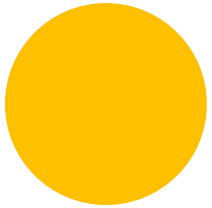



# Dynamo and Python
## The boiler plate

# This video

- Explain the boiler plate
- Explain each common piece of the boiler plate
- Show how to build your Python ‘starter’ template

Python Script

```python
# Made by Gavin Crump
# Free for use
# BIM Guru, www.bimguru.com.au

#Reference for script name: https://github.com/Amoursol/dynamoPython/blob/master/dynamoAPI/dynamoAPICurrentGraphName.py
#Thanks to John Pierson for sharing the code for Dynamo file data

#Add CLR and Dynamo services for its API
import clr
clr.AddReference('DynamoRevitDS')
import Dynamo
from System import Environment

#Add document manager from Revit services
clr.AddReference('RevitServices')
import RevitServices
from RevitServices.Persistence import DocumentManager

# access to the current Dynamo instance and workspace
DynamoCurrent = Dynamo.Applications.DynamoRevit()
ActiveScript  = DynamoCurrent.RevitDynamoModel.CurrentWorkspace
DynamoVersion = DynamoCurrent.RevitDynamoModel.Version

# ensure version 2.X, get name
if DynamoVersion.StartsWith("2."):
    ScriptName = ActiveScript.Name + ".dyn"
else:
    ScriptName = "Version not supported"

# get system user name
UserName = Environment.UserName

# get active document name and path
```

# What is a boiler plate?

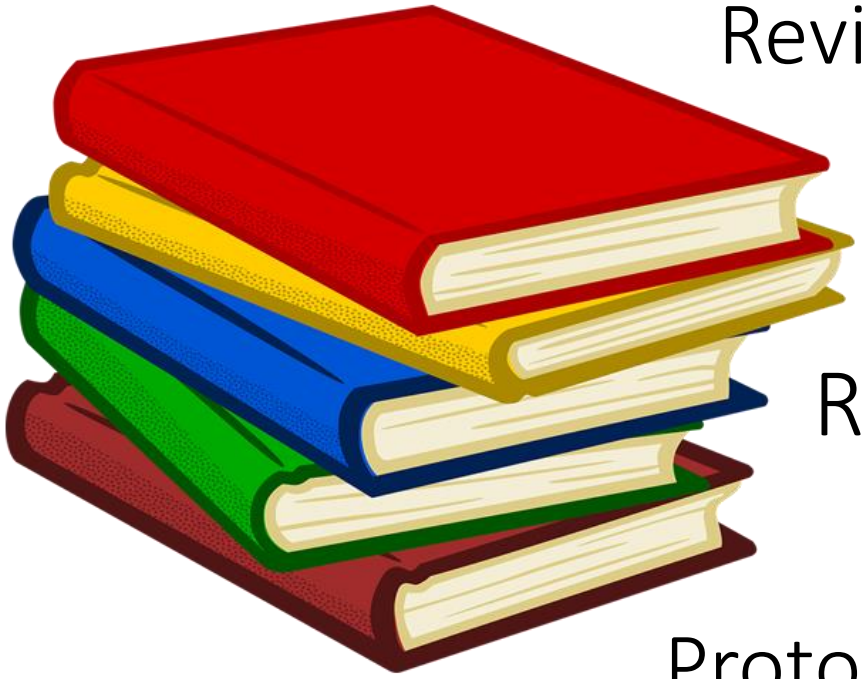
# Syntax
import

```
# comments with a hashtag

import Namespace

from Namespace import *

from Namespace import thing
```

# Woah…
# Let's break this down!

See it a bit like borrowing books from a library for an assignment

clr = the library



Revit nodes

Revit services

Revit API

Proto geometry

# Important

Try not to borrow a whole book!

Python Script

```
1 # Boilerplate text
2 import clr
3
4 clr.AddReference("RevitAPI")
5 clr.AddReference("RevitAPIUI")
6 import Autodesk
7 from Autodesk.Revit.DB import *
```

Python Script

```
1 # Boilerplate text
2 import clr
3
4 clr.AddReference("RevitAPI")
5 clr.AddReference("RevitAPIUI")
6 import Autodesk
7 from Autodesk.Revit.DB import Wall
```

# Important

Don’t check out the whole library

You might not even need it!

# clr

import clr

Common language runtime

- Gets it all started
- Connects python and .net
- Allows you to call on .dlls

# dll's

‘Dynamic link libraries’

- Called on by code
- Like pre-built ‘instructions’

C:\Program Files\Autodesk
\ *Revit xxxx* \AddIns
\DynamoForRevit

- Root folder
- Revit folder

# RevitNodes

```
clr.AddReference("RevitNodes")
import Revit
clr.ImportExtensions(Revit.Elements)
clr.ImportExtensions(Revit.GeometryConversion)
```

- Reference the dll
- Import Revit namespace
- Add more element nodes
- Add more geometry nodes

# ProtoGeometry

```
clr.AddReference('ProtoGeometry')
from Autodesk.DesignScript.Geometry import *
```

- Reference the dll
- Dynamo geometry classes

# Revit API
# RevitAPIUI

```
clr.AddReference("RevitAPI")
clr.AddReference("RevitAPIUI")

import Autodesk
from Autodesk.Revit.DB import *
from Autodesk.Revit.UI import *
```

- Reference API dll’s
- Import Autodesk namespace
- Load Revit API Classes
- Load Revit API UI Classes

# RevitServices

```
clr.AddReference("RevitServices")
import RevitServices
from RevitServices.Persistence import DocumentManager
from RevitServices.Transactions import TransactionManager
```

- Dynamo classes
- Dynamo’s attentive document
- Dynamo making changes to the Revit model (transactions)

# Current Document

```
doc = DocumentManager.Instance.CurrentDBDocument
And maybe
uiapp = DocumentManager.Instance.CurrentUIApplication
app = uiapp.Application
uidoc = uiapp.ActiveUIDocument
```

- Current document
- ‘doc’ is now a variable

# Transaction Start/End

```
TransactionManager.Instance.EnsureInTransaction(doc)
# your actions
TransactionManager.Instance.TransactionTaskDone()
```

- If changing Revit model
- ‘Checks out’ a spot in the db transaction queue
- Usually near script end

# Syntax
Help!

**dir**(object)

Shows all available methods.

object.__doc__

Shows the documentation.

# Templating

C:\Users\ *user name*
\AppData\Roaming\Dynamo
\Dynamo Revit\ *version*

# Templating

**Dynamo Python Primer**

https://dynamopythonprimer.gitbook.io/

By Oliver Green

**Amoursol (github)**

https://github.com/Amoursol/dynamoPython/tree/master/pythonTemplates

By Sol Amour

# Future Videos

- Basic samples
- Revit API
- Advanced samples
- And more!

# Files are on github

https://github.com/aussieBIMguru

# The Boiler Plate

## Python in Dynamo