

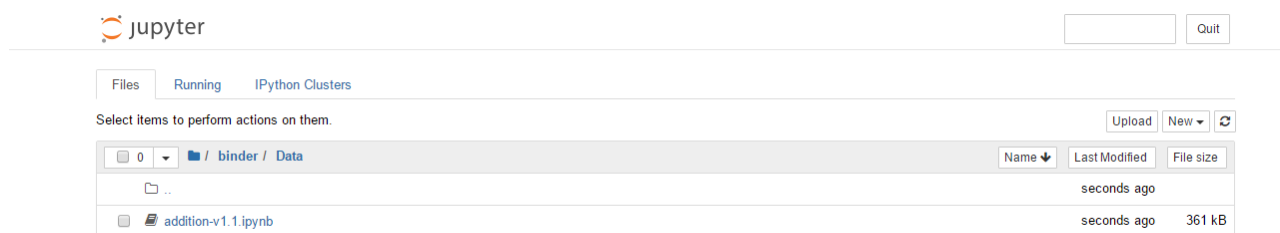
Lecture – Software Life Cycle

SLIDE

Example 01 - Software Life Cycle (Application Phase) Cont...

Steps – Converting addition-v1.1.ipynb Software into an Executable File

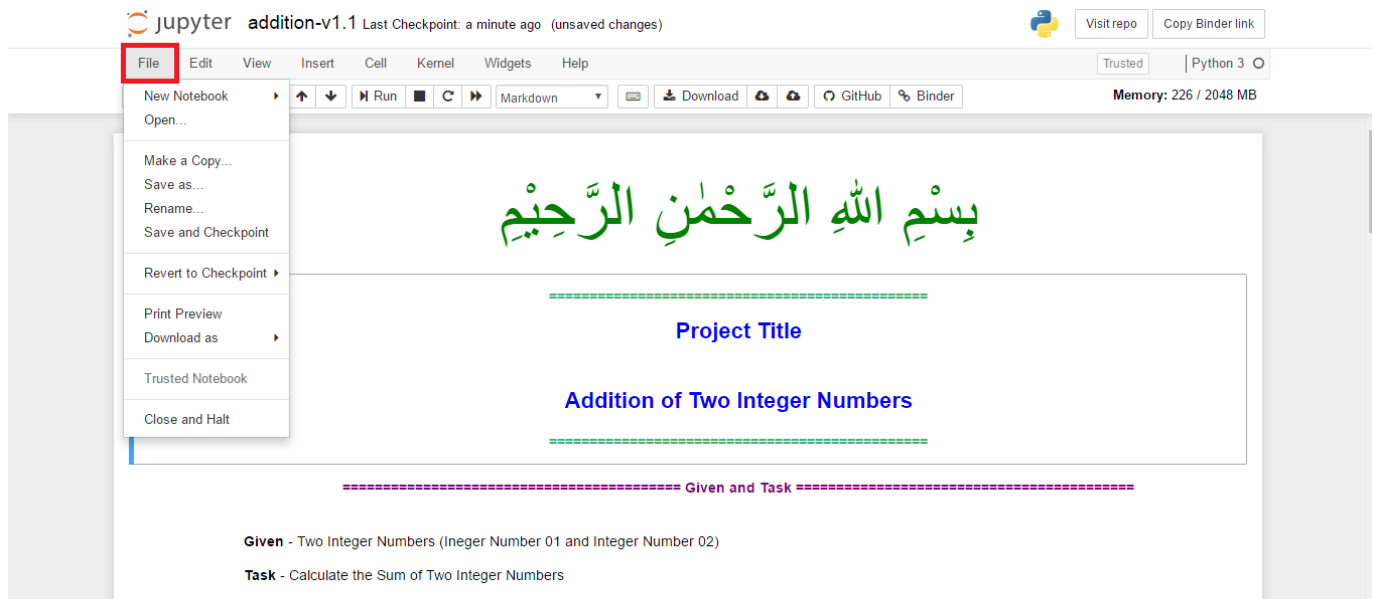
- Step 02: Use your System Settings to Step by Step Convert Program into an Executable File
 - In Sha Allah, in the next Slides, I will follow the following **Two Stage Process** to show how **addition-v1.1.ipynb Software** will be **converted** into an **Executable File**
 - Stage 01: Convert **addition-v1.1.ipynb** File into **addition-v1.1.py** File
 - Step 01: **Open** Jupyter Notebook 5.5.0 IDE



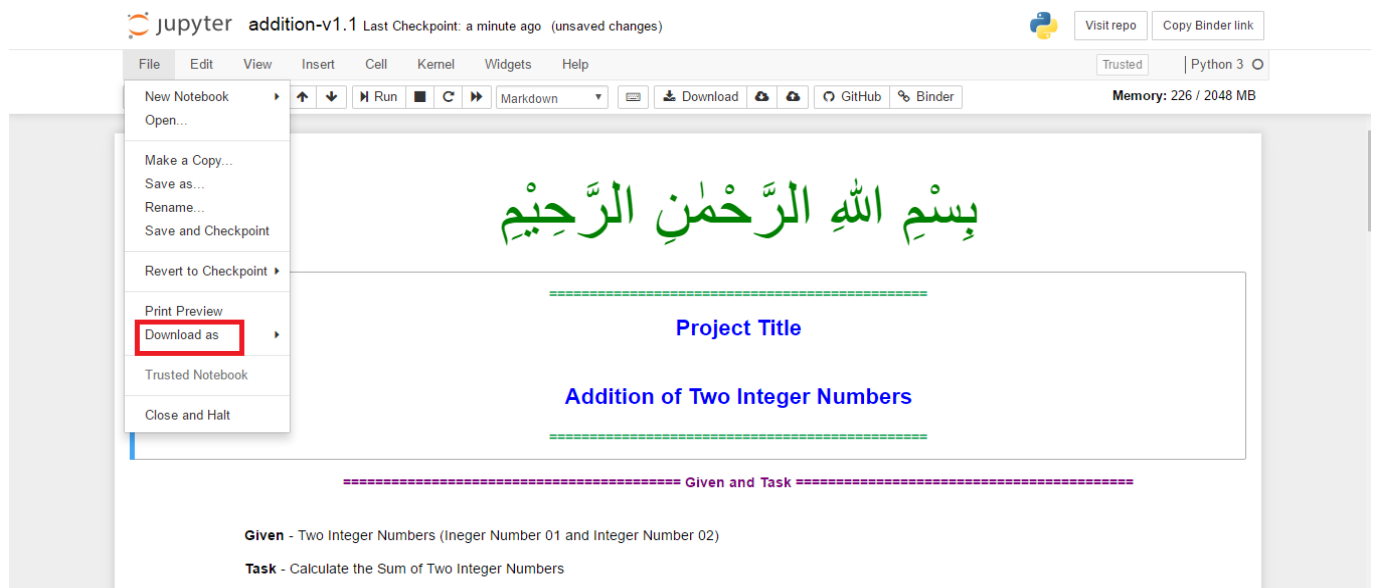
- Step 02: **Open** addition-v1.1.ipynb



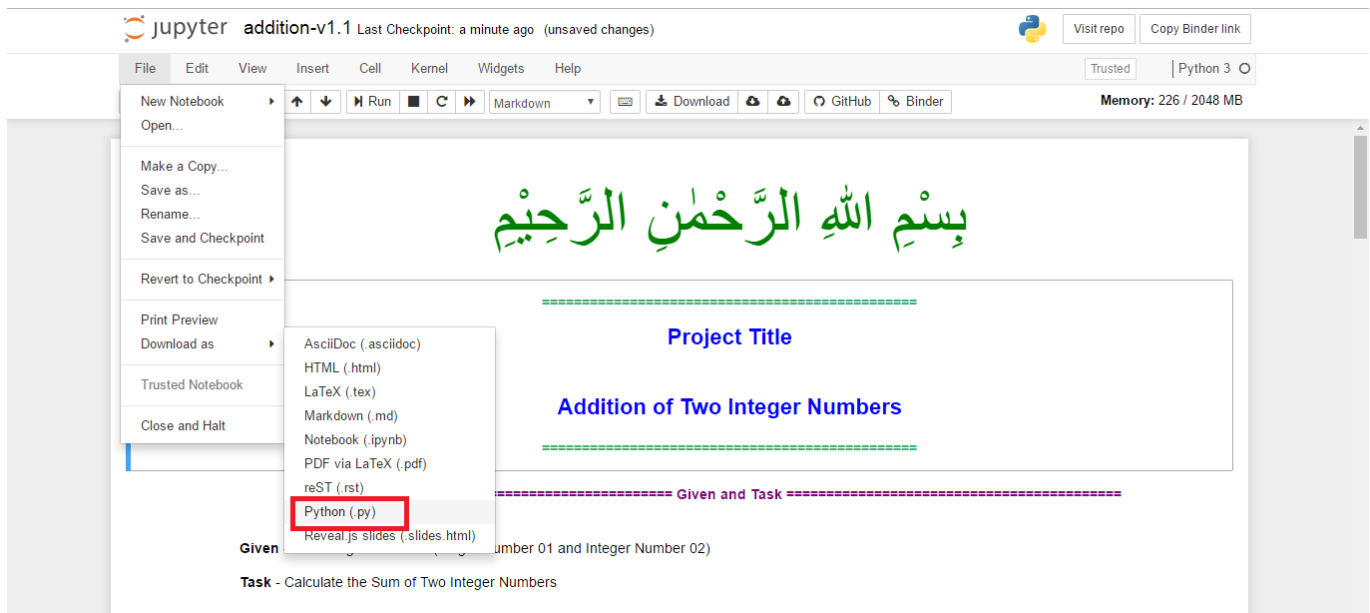
- Step 03: Convert addition-v1.1.ipynb File into addition-v1.1.py File
 - Step 3.1: **Click on File Menu**
 - A **drop-down menu** will be **displayed**



- **Step 3.2: From the drop down, Click on Download as**



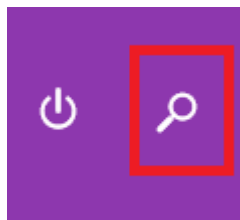
- **Step 3.3: A Sub-menu appears. Click on Python (.py)**



- Step 3.4: A new Tab will Open and addition-v1.1.py File starts downloading
- Stage 02: Convert addition-v1.1.py File into addition-v1.1.exe File
 - Step 01: Click on the Start button in the Task Bar



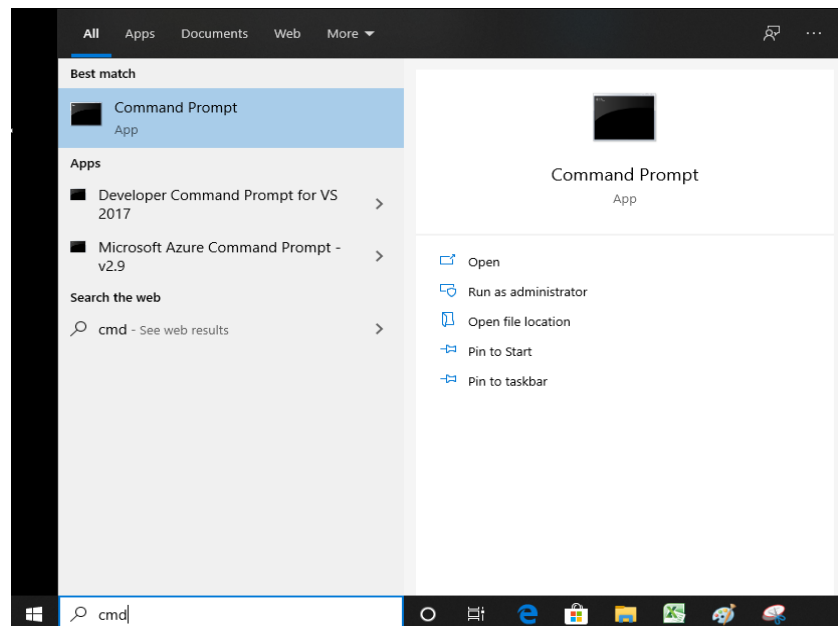
- Step 02: Search for Command Line Prompt (CMD)
 - If you are using Windows 8/8.1 Pro, Search button will appear as shown below



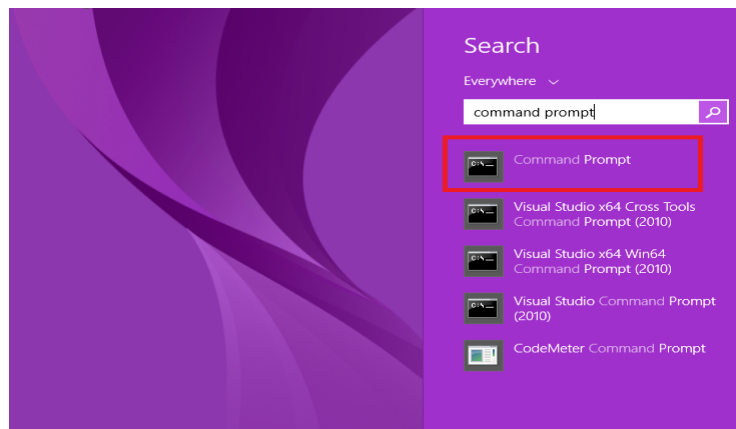
OR

- Step 02: Search for Command Line Prompt (CMD)
 - Note

- If you are using **Windows 10**, **Search** button will appear as shown in below figure



- **Step 03: Click on Command Prompt**



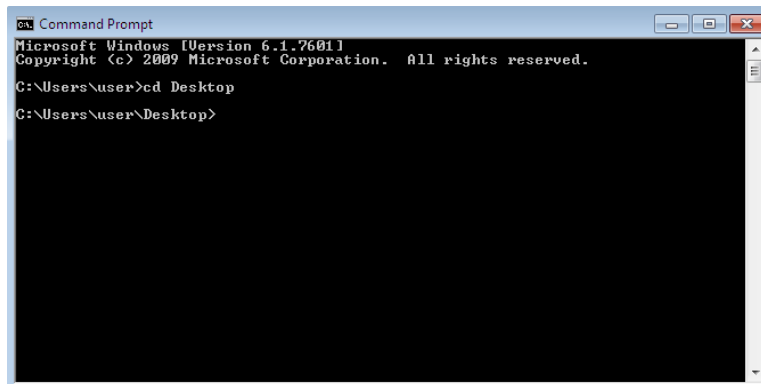
- **Step 04: Command Prompt window will appear on your Computer Screen**



- Step 05: **Navigate** to the **Folder** where **Python (.py)** File is placed using the following **Command**
 - In my case, it is placed on **Desktop**
 - Step 5.1: Click on **Enter** key

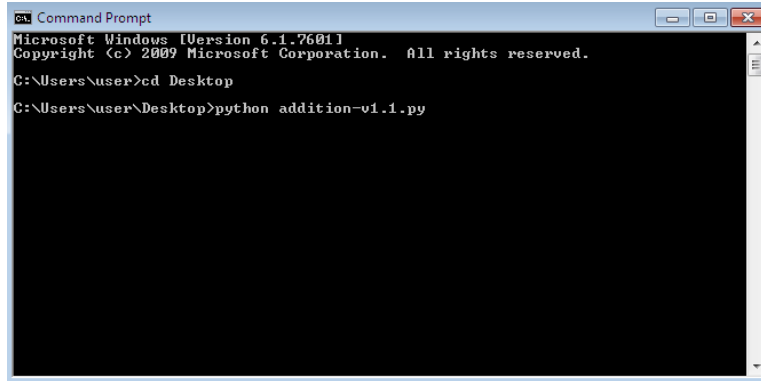
`cd Desktop`

- Step 5.2: The **cmd** will enter to the Desktop Folder



- Step 06: Write the following Command on **cmd**. It will **execute** the Program in **Python (.py)** File
 - Step 6.1: Press **Enter** key

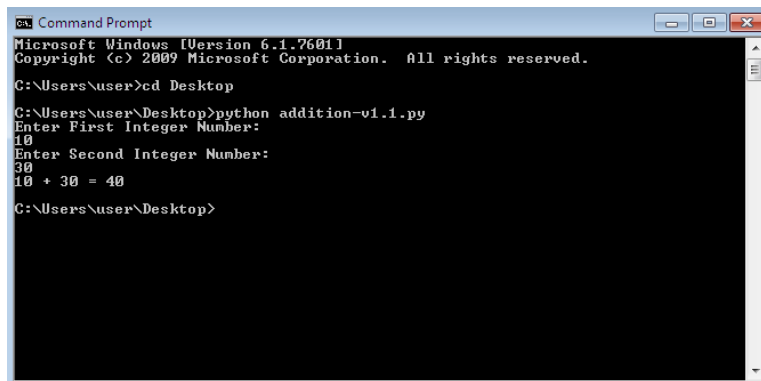
`python addition-v1.1.py`



```
Command Prompt
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\User>cd Desktop
C:\Users\User\Desktop>python addition-v1.1.py
```

- Step 6.2: The **addition-v1.1.py Software** will be **executed** (see Figure below)

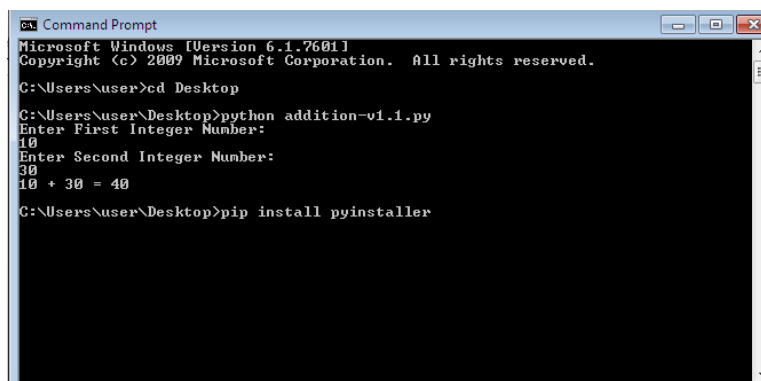


```
Command Prompt
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\User>cd Desktop
C:\Users\User\Desktop>python addition-v1.1.py
Enter First Integer Number:
10
Enter Second Integer Number:
30
10 + 30 = 40
C:\Users\User\Desktop>
```

- Step 07: Now install **pyinstaller** by using the following Command
 - Step 7.1: Press **Enter** Key

pip install pyinstaller



```
Command Prompt
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\User>cd Desktop
C:\Users\User\Desktop>python addition-v1.1.py
Enter First Integer Number:
10
Enter Second Integer Number:
30
10 + 30 = 40
C:\Users\User\Desktop>pip install pyinstaller
```

```
30
10 + 30 = 40

C:\Users\User\Desktop>pip install pyinstaller
Requirement already satisfied: pyinstaller in c:\users\user\appdata\local\programs\python\python37-32\lib\site-packages (4.2)
Requirement already satisfied: pefile>=2017.8.1; sys_platform == "win32" in c:\users\user\appdata\local\programs\python\python37-32\lib\site-packages (from pyinstaller) (2017.4.18)
Requirement already satisfied: pywin32-ctypes>=0.2.0; sys_platform == "win32" in c:\users\user\appdata\local\programs\python\python37-32\lib\site-packages (from pyinstaller) (0.2.0)
Requirement already satisfied: pyinstaller-hooks-contrib>=2020.6 in c:\users\user\appdata\local\programs\python\python37-32\lib\site-packages (from pyinstaller) (2020.11)
Requirement already satisfied: altgraph in c:\users\user\appdata\local\programs\python\python37-32\lib\site-packages (from pyinstaller) (0.17)
Requirement already satisfied: importlib-metadata; python_version < "3.8" in c:\users\user\appdata\local\programs\python\python37-32\lib\site-packages (from pyinstaller) (3.4.0)
Requirement already satisfied: setuptools in c:\users\user\appdata\local\programs\python\python37-32\lib\site-packages (from pyinstaller) (40.6.2)
Requirement already satisfied: future in c:\users\user\appdata\local\programs\python\python37-32\lib\site-packages (from pefile>=2017.8.1; sys_platform == "win32">pyinstaller) (0.18.2)
Requirement already satisfied: typing-extensions>=3.6.4; python_version < "3.8" in c:\users\user\appdata\local\programs\python\python37-32\lib\site-packages (from importlib-metadata; python_version < "3.8">pyinstaller) (3.7.4.3)
Requirement already satisfied: zipp>=0.5 in c:\users\user\appdata\local\programs\python\python37-32\lib\site-packages (from importlib-metadata; python_version < "3.8">pyinstaller) (3.4.0)
You are using pip version 19.0.3, however version 21.0 is available.
You should consider upgrading via the 'python -m pip install --upgrade pip' command.

C:\Users\User\Desktop>
```

- Step 08: **Verify** installation of **pyinstaller** by using the following **Command**

- Step 8.1: Press **Enter** Key

pyinstaller -version

```
Command Prompt

C:\Users\user\Desktop>pyinstaller --version
4.2
```

- Step 8.2: The **pyinstaller version** will be displayed
 - In my case, it is **4.2**

```
Command Prompt

C:\Users\user\Desktop>pyinstaller --version
4.2
C:\Users\user\Desktop>
```

- Step 09: In order to convert a **Python (.py)** File to an **Executable (.exe)** File write following **Command**

- Step 9.1: Press **Enter** key

pyinstaller addition-v1.1.py

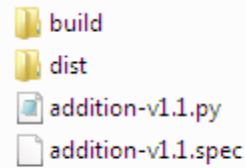
```
Command Prompt
C:\Users\user\Desktop>pyinstaller --version
4.2
C:\Users\user\Desktop>pyinstaller addition-v1.1.py
```

- It starts **Building Analysis**

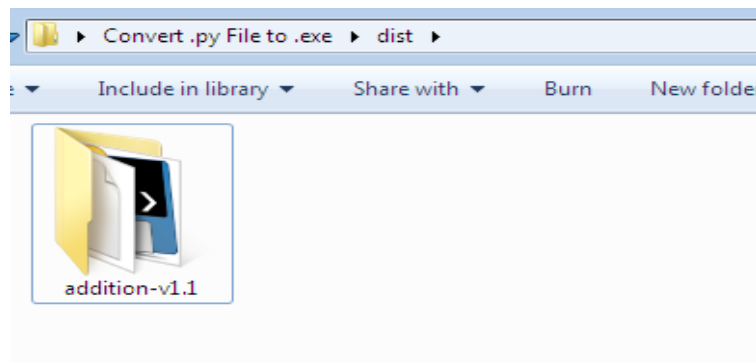
```
Command Prompt
13150 INFO: Excluding import of argparse from module pickle
13150 INFO: Loading module hook 'hook-xml.py' from 'c:\users\user\appdata\lo
cal\programs\python\python37-32\lib\site-packages\PyInstaller\hooks'...
13972 INFO: Looking for ctypes DLLs
13972 INFO: Analyzing run-time hooks ...
13993 INFO: Looking for dynamic libraries
14554 INFO: Looking for eggs
14554 INFO: Using Python library c:\users\user\appdata\local\programs\python\pyt
hon37-32\python37.dll
14554 INFO: Found binding redirects:
[]
14570 INFO: Warnings written to C:\Users\user\Desktop\build\addition-v1.1\warn-a
ddition-v1.1.txt
14664 INFO: Graph cross-reference written to C:\Users\user\Desktop\build\additio
n-v1.1\xref-addition-v1.1.html
14742 INFO: checking PYZ
14742 INFO: Building PYZ because PYZ-00.toc is non existent
14752 INFO: Building PYZ (ZlibArchive) C:\Users\user\Desktop\build\addition-v1.1
\__PYZ__00.pyz
15927 INFO: Building PYZ (ZlibArchive) C:\Users\user\Desktop\build\addition-v1.1
\__PYZ__00.pyz completed successfully.
15943 INFO: checking PKG
15943 INFO: Building PKG because PKG-00.toc is non existent
15943 INFO: Building PKG (Archive) PKG-00.pkg
```

```
Command Prompt
15990 INFO: Bootloader c:\users\user\appdata\local\programs\python\python37-32\l
ib\site-packages\PyInstaller\bootloader\Windows-32bit\run.exe
15990 INFO: checking EXE
15990 INFO: Building EXE because EXE-00.toc is non existent
15990 INFO: Building EXE from EXE-00.toc
16068 INFO: Copying icons from ['c:\users\user\appdata\local\programs\pyth
on\python37-32\lib\site-packages\PyInstaller\bootloader\images\icon-conso
le.ico']
16130 INFO: Writing RT_GROUP_ICON 0 resource with 104 bytes
16130 INFO: Writing RT_ICON 1 resource with 3752 bytes
16146 INFO: Writing RT_ICON 2 resource with 2216 bytes
16146 INFO: Writing RT_ICON 3 resource with 1384 bytes
16146 INFO: Writing RT_ICON 4 resource with 37019 bytes
16146 INFO: Writing RT_ICON 5 resource with 9640 bytes
16146 INFO: Writing RT_ICON 6 resource with 4264 bytes
16146 INFO: Writing RT_ICON 7 resource with 1128 bytes
16146 INFO: Appending archive to EXE C:\Users\user\Desktop\build\addition-v1.1\ad
dition-v1.1.exe
16161 INFO: Building EXE from EXE-00.toc completed successfully.
16172 INFO: checking COLLECT
16172 INFO: Building COLLECT because COLLECT-00.toc is non existent
16177 INFO: Building COLLECT COLLECT-00.toc
18564 INFO: Building COLLECT COLLECT-00.toc completed successfully.
C:\Users\user\Desktop>
```

- Step 10: After **successful Analysis**, Following **Folders** will be displayed on the **navigated Folder** (where **.py File** is placed)
 - build
 - dist
 - addition-v1.1.spec



- **Step 11: Click on **dist** Folder**
 - The **addition-v1.1.exe** Folder will be located



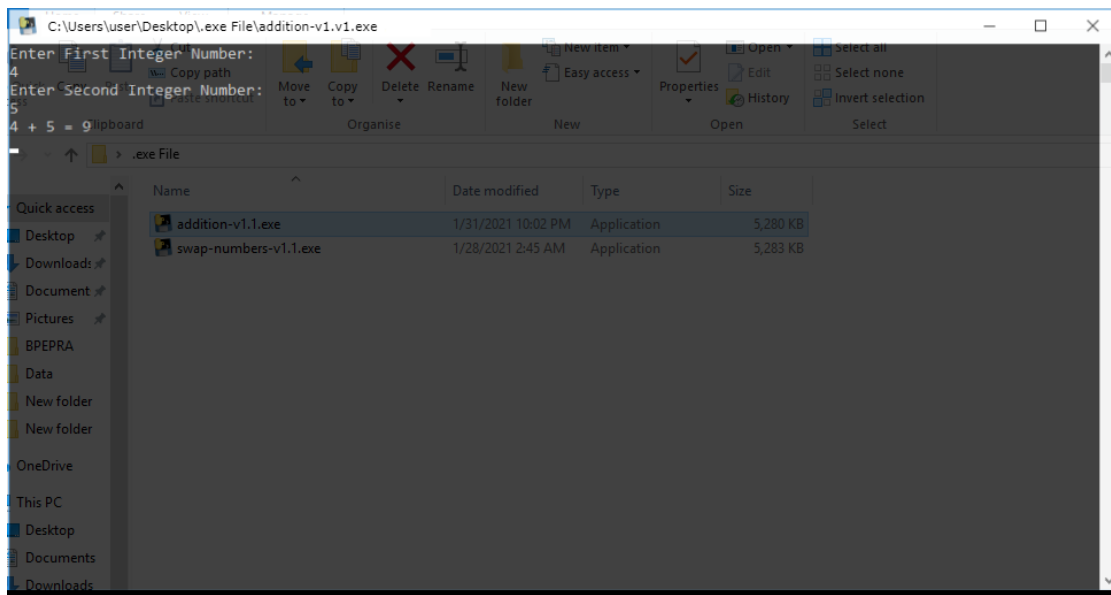
- **Step 12: Click on **addition-v1.1** Folder**
 - **Step 12.1: Inside **addition-v1.1** Folder, there are almost 54 items**

Convert .py File to .exe > dist > addition-v1.1 >			
Include in library		Share with	Burn New folder
Name	Date modified	Type	Size
_bz2.pyd	2021/01/25 1:18 AM	Python Extension ...	72 KB
_hashlib.pyd	2021/01/25 1:18 AM	Python Extension ...	32 KB
_lzma.pyd	2021/01/25 1:18 AM	Python Extension ...	181 KB
_socket.pyd	2021/01/25 1:18 AM	Python Extension ...	66 KB
_ssl.pyd	2021/01/25 1:18 AM	Python Extension ...	102 KB
addition-v1.1.exe	2021/01/28 2:23 AM	Application	1,388 KB
addition-v1.1.exe.manifest	2021/01/28 2:23 AM	MANIFEST File	2 KB
api-ms-win-core-console-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	3 KB
api-ms-win-core-datetime-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	3 KB
api-ms-win-core-debug-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	3 KB
api-ms-win-core-errorhandling-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	3 KB
api-ms-win-core-file-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	5 KB
api-ms-win-core-file-l1-2-0.dll	2021/01/25 1:18 AM	Application extens...	12 KB
api-ms-win-core-file-l2-1-0.dll	2021/01/25 1:18 AM	Application extens...	12 KB
api-ms-win-core-handle-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	3 KB
api-ms-win-core-heap-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	4 KB
api-ms-win-core-interlocked-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	4 KB
api-ms-win-core-libraryloader-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	4 KB
api-ms-win-core-localization-l1-2-0.dll	2021/01/25 1:18 AM	Application extens...	14 KB
api-ms-win-core-memory-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	4 KB
api-ms-win-core-namedpipe-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	4 KB
api-ms-win-core-processenvironment-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	4 KB
api-ms-win-core-processthreads-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	5 KB
api-ms-win-core-processthreads-l1-1-1.dll	2021/01/25 1:18 AM	Application extens...	12 KB
api-ms-win-core-profile-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	3 KB
api-ms-win-core-rtlsupport-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	3 KB
api-ms-win-core-string-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	3 KB

■ **Step 13: Double Click on addition-v1.1.exe**

Convert .py File to .exe > dist > addition-v1.1 >			
Include in library		Share with	Burn New folder
Name	Date modified	Type	Size
_bz2.pyd	2021/01/25 1:18 AM	Python Extension ...	72 KB
_hashlib.pyd	2021/01/25 1:18 AM	Python Extension ...	32 KB
_lzma.pyd	2021/01/25 1:18 AM	Python Extension ...	181 KB
_socket.pyd	2021/01/25 1:18 AM	Python Extension ...	66 KB
_ssl.pyd	2021/01/25 1:18 AM	Python Extension ...	102 KB
addition-v1.1.exe	2021/01/28 2:23 AM	Application	1,388 KB
addition-v1.1.exe.manifest	2021/01/28 2:23 AM	MANIFEST File	2 KB
api-ms-win-core-console-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	3 KB
api-ms-win-core-datetime-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	3 KB
api-ms-win-core-debug-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	3 KB
api-ms-win-core-errorhandling-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	3 KB
api-ms-win-core-file-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	5 KB
api-ms-win-core-file-l1-2-0.dll	2021/01/25 1:18 AM	Application extens...	12 KB
api-ms-win-core-file-l2-1-0.dll	2021/01/25 1:18 AM	Application extens...	12 KB
api-ms-win-core-handle-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	3 KB
api-ms-win-core-heap-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	4 KB
api-ms-win-core-interlocked-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	4 KB
api-ms-win-core-libraryloader-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	4 KB
api-ms-win-core-localization-l1-2-0.dll	2021/01/25 1:18 AM	Application extens...	14 KB
api-ms-win-core-memory-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	4 KB
api-ms-win-core-namedpipe-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	4 KB
api-ms-win-core-processenvironment-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	4 KB
api-ms-win-core-processthreads-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	5 KB
api-ms-win-core-processthreads-l1-1-1.dll	2021/01/25 1:18 AM	Application extens...	12 KB
api-ms-win-core-profile-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	3 KB
api-ms-win-core-rtlsupport-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	3 KB
api-ms-win-core-string-l1-1-0.dll	2021/01/25 1:18 AM	Application extens...	3 KB

- **Step 13.1: A new cmd will be displayed and Software will be executed**

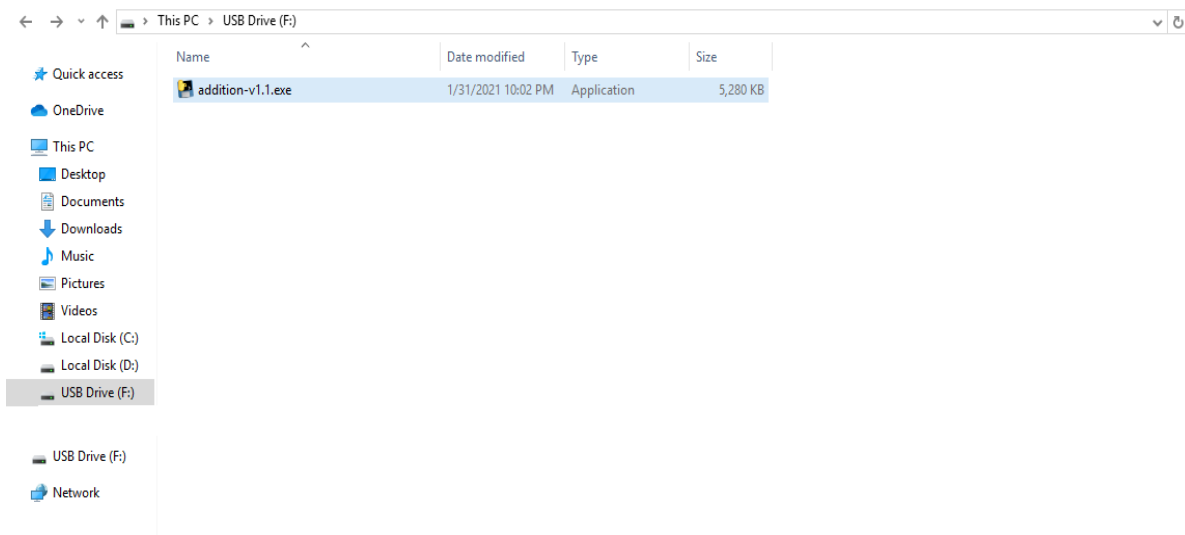


SLIDE

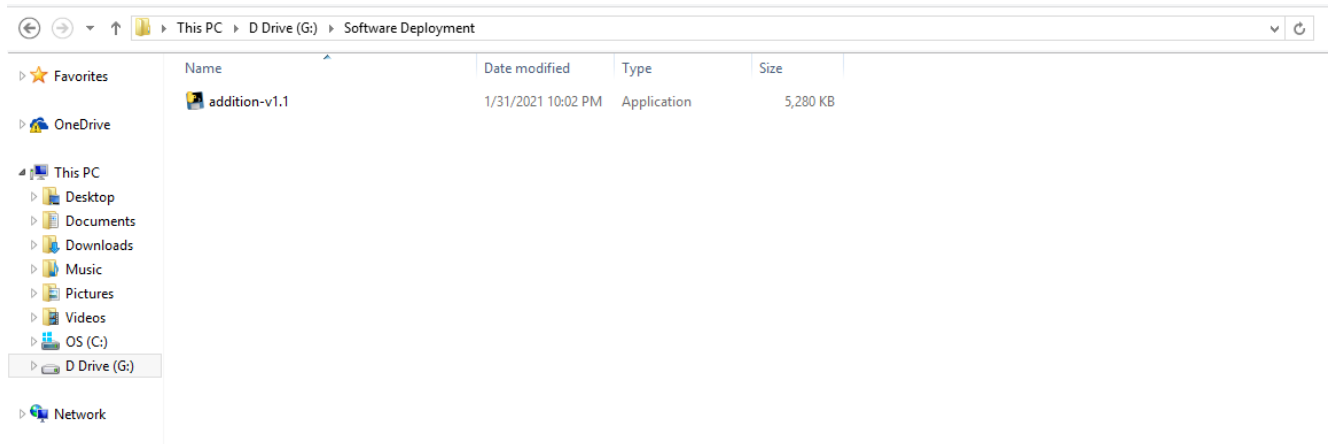
Example 01 - Software Life Cycle (Application Phase) Cont...

Steps – Deploying the Executable File on Client Machine

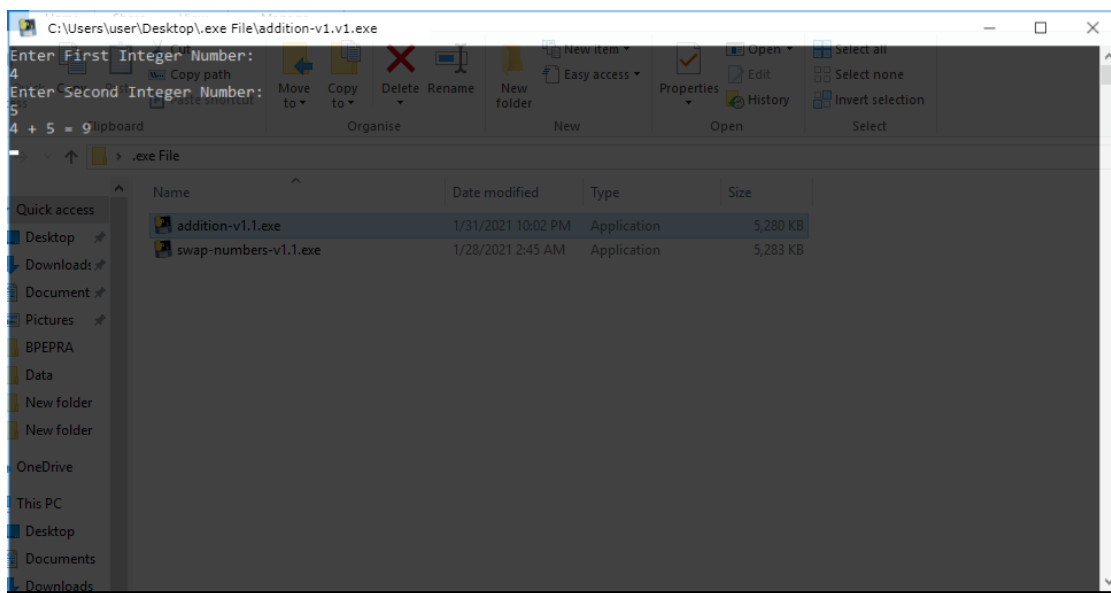
- **Alhumdulillah**, I have **converted** the **.py** file to **.exe** File and saved in my Laptop. In Sha Allah, now I will **deploy** the **.exe** File on the **Client Machine** in the following Steps
 - **Step 01:** I will **Copy** the **addition-v1.1.exe** File from **my Laptop** into a **USB Drive**



- **Step 02: From my USB, I will Copy addition-v1.1.exe File on Client's Machine at the following Path: D:\Software Deployment\addition-v1.1.exe**



- **Step 03: Double Click on the addition-v1.1.exe File**
 - **A Command Line Prompt will Open and Deployed Software will be executed In Sha Allah 🤖**



SLIDE

Example 01 - Software Life Cycle (Feedback Phase)

- **Step 01: After Software Deployment, take regular Feedback from**
 - **Domain Experts and Users on Deployed Software**

- **Step 02: Make a List of Possible Improvements based on Feedback received**
- **Step 03: Improve your Software based on List of Possible Improvements (made in Step 02)**