Python Coding - with example scenario

February 28, 2023

[120]:

```python
import pandas as pd
import re
df=pd.read_excel('WBS library.xlsx')
df2=pd.read_excel('building data.xlsx')
```

[121]:

```python
#Keyword questionnaire
WBS_name=input('Hi, first of all, please give me a name for this Work Breakdown Structure: ')
```

```
Hi, first of all, please give me a name for this Work Breakdown Structure: Spa
Building
```

[122]:

```python
#Question 1
single_or_multi=int(input('Will this be (1) a single or (2) multi-story building? Please answer 1 or 2: '))
if(single_or_multi==1):
    single = int(input('(1) Cladded facade or (2) brickwork? Please answer 1 or 2: '))
    if(single==1):
        B = 3
    else:
        B = 6
else:
    print('OK, a multi-story building.')
    frame=int(input('Will the frame be (1) steel & timber, (2) steel and concrete or (3) other? Please answer 1, 2 or 3: '))
    if(frame==1):
        outer = input('(1) Curtain wall or (2) Cladded? ')
        if(outer==1):
            B = 2
        else:
            B = 5
    else:
        if(frame == 2):
            outer = input('(1) Curtain wall or (2) Cladded? ')
            if(outer==1):
                B = 4
            else:
                B = 1
        else:
                B = 7
B = str(B)
print("Excellent, it looks like you want building type B"+B+".")
B = int(B)
print("")
```

```
Will this be (1) a single or (2) multi-story building? Please answer 1 or 2: 2
OK, a multi-story building.
Will the frame be (1) steel & timber, (2) steel and concrete or (3) other?
Please answer 1, 2 or 3: 2
(1) Curtain wall or (2) Cladded? 2
Excellent, it looks like you want building type B1.
```

[123]:

```
print("Now for any other extras, please type in, seperated by commas, any extra␣
 ↪items you wish from the list below.")
```

```
Now for any other extras, please type in, seperated by commas, any extra items
you wish from the list below.
```

[242]:

```
print("roof terrace, Clearance/Establishment, Simple Foundations, Steel/Concrete␣
 ↪FramedBrickwork, Cladded FaÃ§ade, Membrane Roof, General M&E Services,␣
 ↪Utilities/External Services, Testing & Commissioning, Multi-Storey, with␣
 ↪Finishes, with Landscaping, General External Works, with Fit-out, Steel/Timber␣
 ↪framed, Brickwork, Curtain Wall, FaÃ§ade, Composite, Asphalt, Roof, Bathroom,␣
 ↪Pods, Fire Stopping, Brickwork, Curtain Wall, Cladded FaÃ§ade, Asphalt, Roof,␣
 ↪Mock Ups, General Enabling Works, Surveys, Utility Diversions, Composite Green␣
 ↪Roof, Theatre, Car Park, Slate Roof, Spa, Steel Framed, Brickwork FaÃ§ade, Any␣
 ↪Roof, Medical Equipment, Green Roof: ")
done_listing = "n"
extra_list = []
while done_listing == "n":
    extra=input("Please enter your next extra item")
    extra_list.append(extra)
    done_listing = input("Have you finished? Please enter y/n")
```

```
roof terrace, Clearance/Establishment, Simple Foundations, Steel/Concrete
FramedBrickwork, Cladded FaÃ§ade, Membrane Roof, General M&E Services,
Utilities/External Services, Testing & Commissioning, Multi-Storey, with
Finishes, with Landscaping, General External Works, with Fit-out, Steel/Timber
framed, Brickwork, Curtain Wall, FaÃ§ade, Composite, Asphalt, Roof, Bathroom,
Pods, Fire Stopping, Brickwork, Curtain Wall, Cladded FaÃ§ade, Asphalt, Roof,
Mock Ups, General Enabling Works, Surveys, Utility Diversions, Composite Green
Roof, Theatre, Car Park, Slate Roof, Spa, Steel Framed, Brickwork FaÃ§ade, Any
Roof, Medical Equipment, Green Roof:
Please enter your next extra itemSpa
Have you finished? Please enter y/nn
```

```
Please enter your next extra itemCar
Have you finished? Please enter y/ny
```

[243]:
```
print(extra_list)
```

```
['Spa', 'Car ']
```

[244]:
```
B= str(B)
```

[245]:
```
base_building=df2[df2['Building'].str.contains(B)] # | is or
```

[246]:
```
spec_string='|'.join(extra_list)
```

[247]:
```
print(spec_string)
```

```
Spa|Car
```

[248]:
```
extra_wbs=df[df['Description_Tier 2'].str.contains(spec_string, na=False)] # |␣
 ↪is or
display(extra_wbs)
extra_wbs2=df[df['Description_Tier 3'].str.contains(spec_string, na=False)] # |␣
 ↪is or
display(extra_wbs2)
```

```
     Building  Tier 1  Tier 2  Tier 3  Description_Tier 2 Description_Tier 3  \
150       NaN    5000    5400    5401  Swimming Pools/Spa              Pools
151       NaN    5000    5400    5402  Swimming Pools/Spa            Jacuzzi
152       NaN    5000    5400    5403  Swimming Pools/Spa              Sauna

    Category_Tier 1
150    M&E Services
151    M&E Services
152    M&E Services
```

```
     Building  Tier 1  Tier 2  Tier 3 Description_Tier 2  \
230       NaN    8000    8100    8103      Highway Works
231       NaN    8000    8100    8104      Highway Works
232       NaN    8000    8100    8110      Highway Works

               Description_Tier 3 Category_Tier 1
230       Car Park Floor Markings  External Works
231  Automatic Car Parking System  External Works
232                      Car Park  External Works
```

[249]:
```
full_wbs= pd.concat([base_building, extra_wbs, extra_wbs2])
display(full_wbs)
```

```
    Building  Tier 1 Tier 2 Tier 3  \
0         B1       0    100    NaN
1         B1    1000   1100    NaN
```

```
2         B1    2000   2100    NaN
3         B1    2000   2200    NaN
4         B1    3000   3050    NaN
5         B1    3000   3200    NaN
6         B1    3000   3500   3502
7         B1    3000   3660    NaN
8         B1    4000   4200    NaN
9         B1    5000   5100    NaN
10        B1    5000   5150    NaN
11        B1    5000   5200    NaN
12        B1    5000   5200   5236
13        B1    5000   5600    NaN
14        B1    5000   5700    NaN
15        B1    5000   5900    NaN
16        B1    6000   6100    NaN
17        B1    6000   6700    NaN
18        B1    7000   7050    NaN
19        B1    7000   7200    NaN
20        B1    7000   7340    NaN
21        B1    7000   7600    NaN
22        B1    7000   7640    NaN
23        B1    7000   7740    NaN
24        B1    7000   7800    NaN
25        B1    8000   8400    NaN
26        B1    8000   8400   8450
27        B1    8000   8700   8702
28        B1    8000   8900    NaN
29        B1    9000   9100    NaN
30        B1    9000   9100   9104
150      NaN    5000   5400   5401
151      NaN    5000   5400   5402
152      NaN    5000   5400   5403
230      NaN    8000   8100   8103
231      NaN    8000   8100   8104
232      NaN    8000   8100   8110

                                    Description_Tier 2  \
0    Demolition                                    ...
1    Piling                                        ...
2    Insitu Concrete Frame                         ...
3    Structural Steelwork                          ...
4    Brickwork/Blockwork                           ...
5    Cladding                                      ...
6    Curtain Walling Standard                      ...
7    Facade Access Equipment                       ...
8                             Roof Membrane/Single Ply
9    Electrical Services                           ...
10                                     Smart Buildings
```

```
11                                 Mechanical Services
12                                 Mechanical Services
13                         Utilities/External Services
14                                                BWIC
15                                       Commissioning
16   Lifts                                         ...
17                                 Air Leakage Testing
18   Partitions/Dry Lining                         ...
19                                      Stone Finishes
20                                     General Joinery
21                                     Raised Flooring
22                                      Floor Finishes
23                                         Decorations
24                                           Metalwork
25                                    Hard Landscaping
26                                    Hard Landscaping
27                                Furniture / Features
28                                  Signage (External)
29                      Furniture Fittings & Equipment
30                      Furniture Fittings & Equipment
150                                 Swimming Pools/Spa
151                                 Swimming Pools/Spa
152                                 Swimming Pools/Spa
230                                      Highway Works
231                                      Highway Works
232                                      Highway Works

               Description_Tier 3   Category_Tier 1
0                             NaN    Enabling Works
1                             NaN      Substructure
2                             NaN    Superstructure
3                             NaN    Superstructure
4                             NaN          Envelope
5                             NaN          Envelope
6                    wintergarden          Envelope
7                             NaN          Envelope
8                             NaN              Roof
9                             NaN      M&E Services
10                            NaN      M&E Services
11                            NaN      M&E Services
12               Smoke Extraction      M&E Services
13                            NaN      M&E Services
14                            NaN      M&E Services
15                            NaN      M&E Services
16                            NaN  Special Packages
17                            NaN  Special Packages
18                            NaN          Finishes
19                            NaN          Finishes
```

```
20                            NaN          Finishes
21                            NaN          Finishes
22                            NaN          Finishes
23                            NaN          Finishes
24                            NaN          Finishes
25                            NaN    External Works
26      Soft Landscaping/Planting    External Works
27              External Features    External Works
28                            NaN    External Works
29                            NaN       Fitting Out
30               Washroom Fit Out       Fitting Out
150                         Pools      M&E Services
151                       Jacuzzi      M&E Services
152                         Sauna      M&E Services
230       Car Park Floor Markings    External Works
231  Automatic Car Parking System    External Works
232                     Car Park     External Works
```

[250]:

```
!pip install XlsxWriter
```

```
Defaulting to user installation because normal site-packages is not writeable
Requirement already satisfied: XlsxWriter in c:\programdata\anaconda3\lib\site-
packages (3.0.3)
```

[251]:

```
complete_df=pd.DataFrame(full_wbs)
df3=pd.read_excel('output.xlsx')
```

[252]:

```
complete_df.to_excel('output.xlsx', sheet_name='Sheet1', index=False)
```

[ ]:

```

```