

Step 1: At first, put the following files in one specific directory (Figure 1):

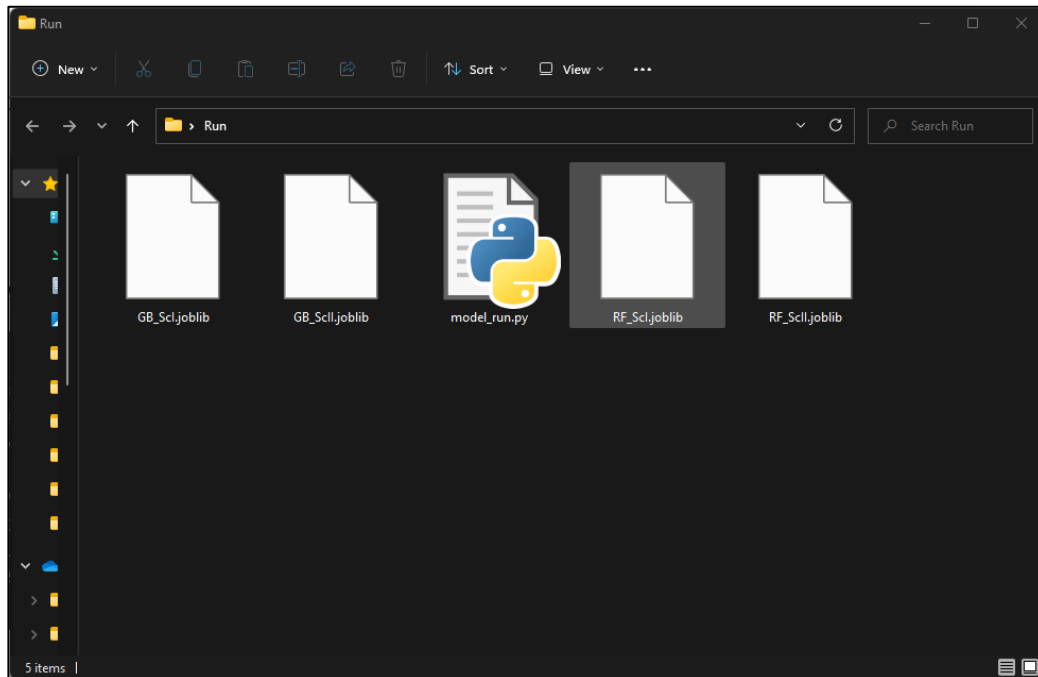


Figure 1: Step1

Step 2: Make sure that you have installed the following libraries in your environment¹:

1. Numpy
2. Pandas
3. Sklearn

Step 3: Run the *model_run.py* file; the following options will appear (Figure 2):

```
C:\Windows\py.exe
*****
*****
First select the number of your predictive model based on the following options

[1] Random Forest _ First Scenario (only visual indices)
[2] Random Forest _ Second Scenario (visual indices + compressive strength of concrete)
[3] Gradient Boost _ First Scenario (only visual indices)
[4] Gradient Boost _ Second Scenario (visual indices + compressive strength of concrete)
```

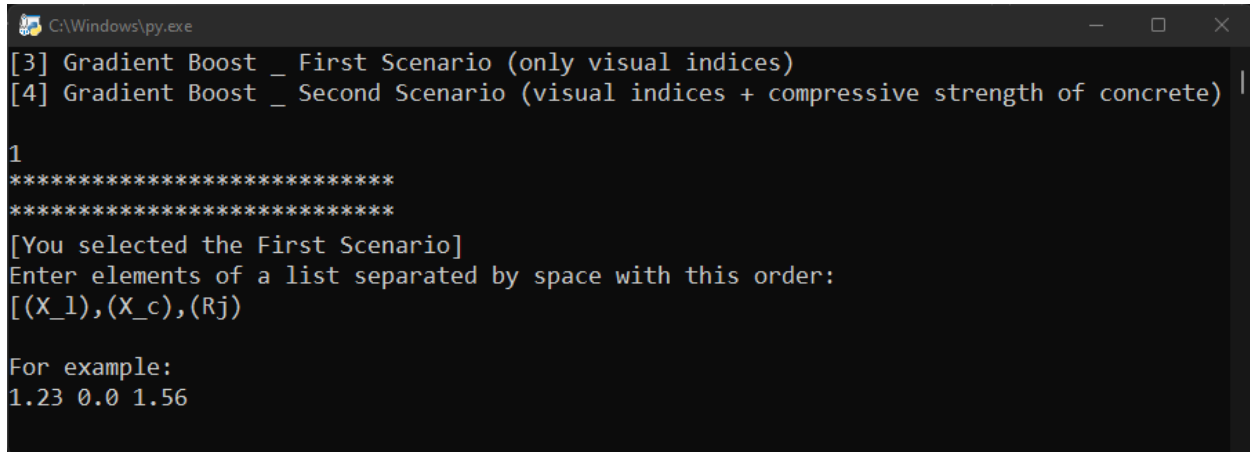
Figure 2: Step 2, predictive models

Step 4: Select one of the proposed models by writing the number of the model:

¹ Required libraries can be installed with pip install method, click [here](#) for more information

For example, write: 1 and then press *Enter* for running the Random Forest model in the first scenario:

[1] Random Forest _ First Scenario (only visual indices)



```
C:\Windows\py.exe
[3] Gradient Boost _ First Scenario (only visual indices)
[4] Gradient Boost _ Second Scenario (visual indices + compressive strength of concrete)

1
*****
*****
[You selected the First Scenario]
Enter elements of a list separated by space with this order:
[(X_1),(X_c),(Rj)]

For example:
1.23 0.0 1.56
```

Figure 3. select your predictive model

Step 5: enter the required inputs in this order: X_1 , X_2 , X_3 , and X_4 (if required), and separate them with space according to Figure 4. For example, if you want to evaluate a BCJ with the following properties:

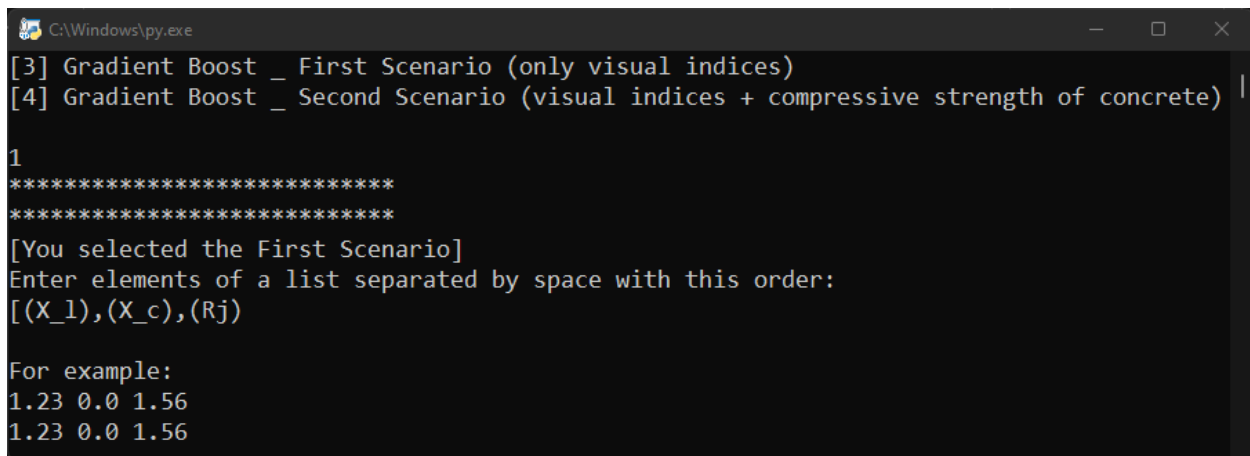
Cracking index= 1.23

Crushing index= 0.0

Joint aspect ratio= 1.56

You must enter: 1.23 0.0 1.56

And then press the *Enter* bottom



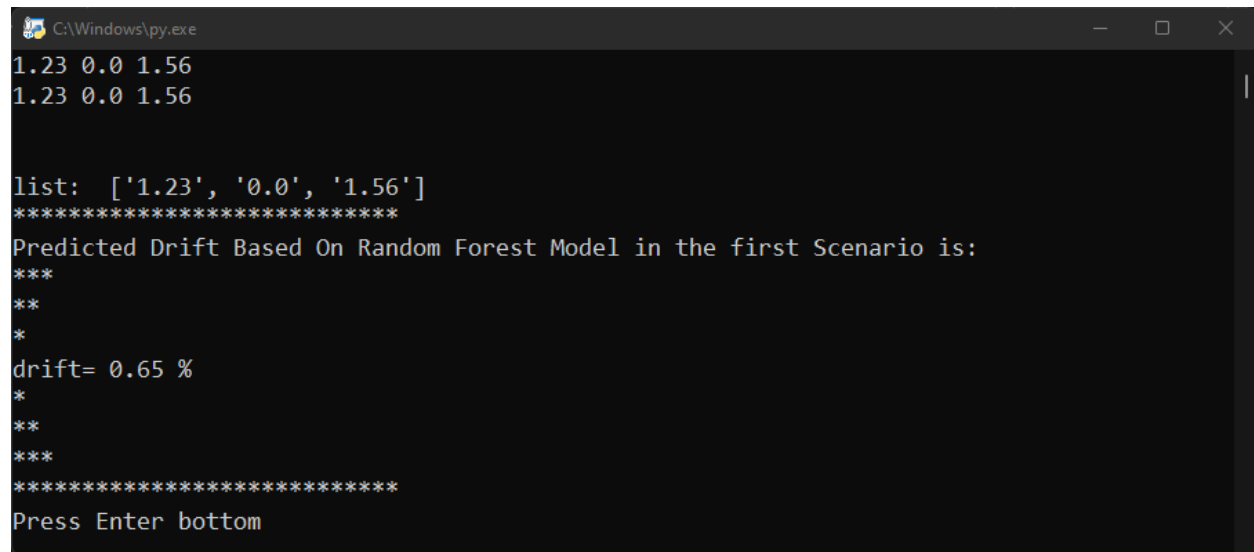
```
C:\Windows\py.exe
[3] Gradient Boost _ First Scenario (only visual indices)
[4] Gradient Boost _ Second Scenario (visual indices + compressive strength of concrete)

1
*****
*****
[You selected the First Scenario]
Enter elements of a list separated by space with this order:
[(X_1),(X_c),(Rj)]

For example:
1.23 0.0 1.56
1.23 0.0 1.56
```

Figure 4. Enter the required inputs

The output of the model will be shown as depicted in Figure 5.



```
C:\Windows\py.exe
1.23 0.0 1.56
1.23 0.0 1.56

list: ['1.23', '0.0', '1.56']
*****
Predicted Drift Based On Random Forest Model in the first Scenario is:
***
**
*
drift= 0.65 %
*
**
***
*****
Press Enter bottom
```

Figure 5. Output of the model