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Branch - CBA Batch - 41
FP Practical 10

Institute of Computer Technology
B. Tech Computer Science and Engineering

Sub: (2CSE403) FUNCTIONAL PROGRAMMING

Practical 10

1. A housekeeper is supposed to keep 8 plants in entrance of house to make it decorative. he initially arranges all 8 plants in single row keeping to make it look like a fencing to garden area of house. The next day, the owner of the house seems isn't happy enough by the arrangement made by the housekeeper and asks him to place it equally on both sides of entrance. All the plants are of different sizes and types. After few days, proper care to plants is giving by providing adequate amount of water and two different nutrition to it. Due to much sunlight 2 plants are destroyed and the owner decides to replace it with 2 new plants of a specific existing type only. Also owner thinks to take away 2 different plants to other side of house. Finally, owner thinks to rearrange alike plants together and keep them on one side and rest all on other. Kindly help the housekeeper to make possible arrangements.

Note: plants are given name w.r.t numbers.

Code :

```
import numpy as np
from YSL_io import *

plants = np.array(range(0, 8))
printGRN('\nInitial plants arrangement : ')
print(plants)
plants = plants.reshape(2,4)
```

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```
printMGNTA('\nAfter equal distribution : ')

print(plnts)

plnts = np.delete(plnts, -1, axis=1)

printORNG('\nAfter 2 plants are destroyed : ')

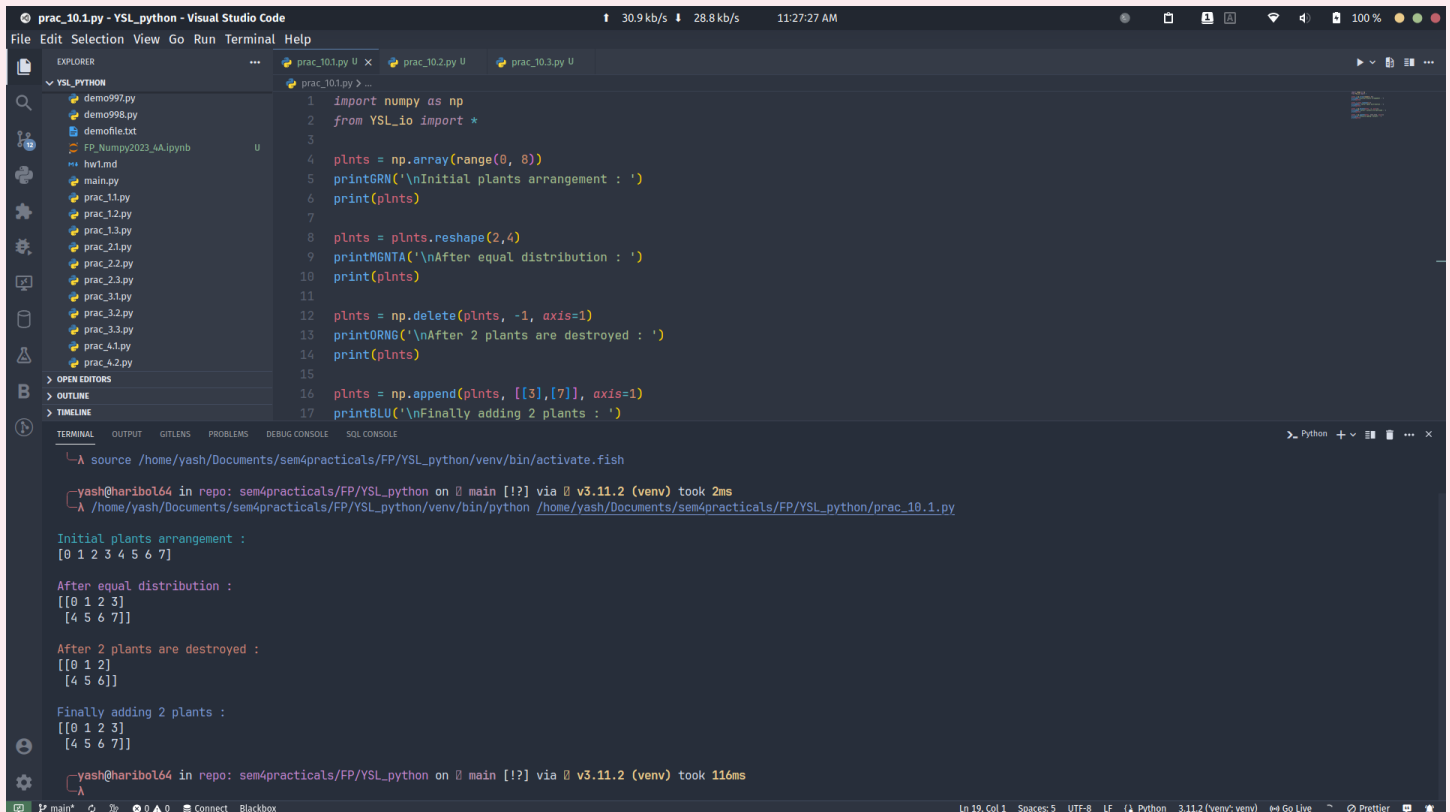
print(plnts)

plnts = np.append(plnts, [[3],[7]], axis=1)

printBLU('\nFinally adding 2 plants : ')

print(plnts)
```

Output :



The screenshot shows a Visual Studio Code window with a Python file named `prac_10.1.py` open. The file contains a script that manipulates a 2D array of plant data. The script starts by importing `numpy` and `YSL_io`. It then creates an array `plnts` with values `range(0, 8)` and prints it. Next, it reshapes the array to `(2, 4)` and prints it. Then, it deletes the last element of the array along the first axis and prints the result. Finally, it appends two new rows `[[3], [7]]` to the array and prints the final result.

The terminal output shows the execution of the script, displaying the initial array, the array after equal distribution, the array after 2 plants are destroyed, and the final array after adding 2 plants.

```
Initial plants arrangement :
[0 1 2 3 4 5 6 7]

After equal distribution :
[[0 1 2 3]
 [4 5 6 7]]

After 2 plants are destroyed :
[[0 1 2]
 [4 5 6]]

Finally adding 2 plants :
[[0 1 2 3]
 [4 5 6 7]]
```

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2. University conducts examination (practical + theory) for students. The following frequency distribution tables shows the marks obtained by 100 students:

Theory Marks	0-20	20-40	40-60	60-80	80-100
No. of students	6	x	46	y	8

Practical Marks	0-20	20-40	40-60	60-80	80-100
No. of students	10	28	X	y	32

As shown above, while making entry the exam controller is unable to understand few entries made by examiner, kindly help controller to identify no. of students. Also, plot a histogram corresponding to practical examination result.

Code:

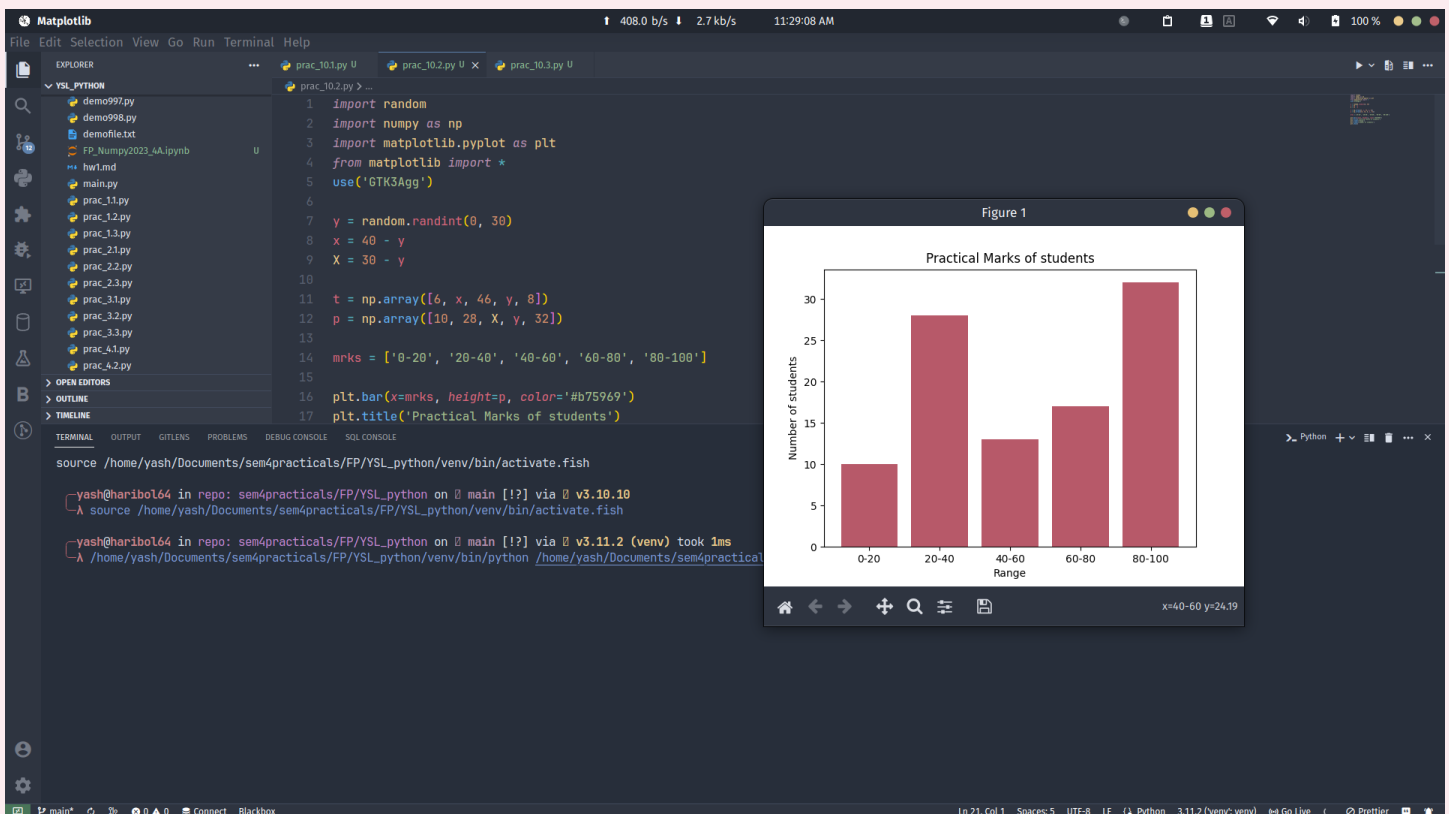
```
import random
import numpy as np
import matplotlib.pyplot as plt
from matplotlib import *
use('GTK3Agg')

y = random.randint(0, 30)
x = 40 - y
X = 30 - y
```

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```
t = np.array([6, x, 46, y, 8])  
p = np.array([10, 28, X, y, 32])  
mrks = ['0-20', '20-40', '40-60', '60-80', '80-100']  
  
plt.bar(x=mrks, height=p, color='#b75969')  
plt.title('Practical Marks of students')  
plt.xlabel('Range')  
plt.ylabel('Number of students')  
plt.show()
```

Output :



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3. A student has scored E1= [20,18,30,22,15] marks (out of 40) and E2 = [19, 22,33,30,19] during 2 mid semester exams. A teacher is supposed to graphically show the difference of marks and compare performances of student. Help the teacher to do graphical representation.

Code:

```
from pandas import *
from pandas import DataFrame as df
import matplotlib.pyplot as plt
from matplotlib import *
from YSL_io import *
use('GTK3Agg')

mrks = {
    'E1' : [20, 18, 30, 22, 15],
    'E2' : [19, 22, 33, 30, 19]
}

i = ['FP', 'SE', 'OS', 'FET', 'PS']

frame = df(mrks, index=i)
print()
printGRN(frame)

frame.plot.bar(rot=0, color=['#5e81cc', '#b75969']).set_title('Marks
comparison of mid sem exams', fontsize=16)
```

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```
# Toresize graph window to max in my screen by default on opening it  
# m = plt.get_current_fig_manager().resize(1920, 1080)  
  
plt.show()
```

Output :

