

Computing and Simulation for Autonomy, Fall 2021

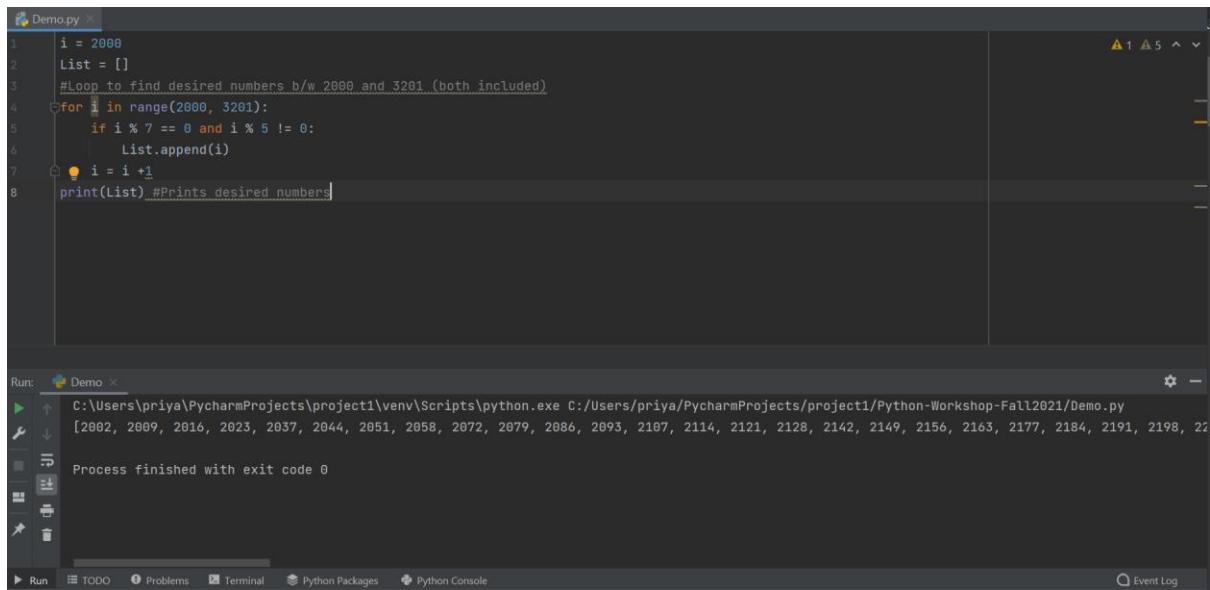
Homework-2 Programming Exercises – Python

-Priyanshu Rawat

Here is the GitHub link with all the codes:

https://github.com/priyanshurawat1509/homework_2/blob/5e8907639d843a849fc72dcb9497b6779c422592/homework2.py

Question 1)



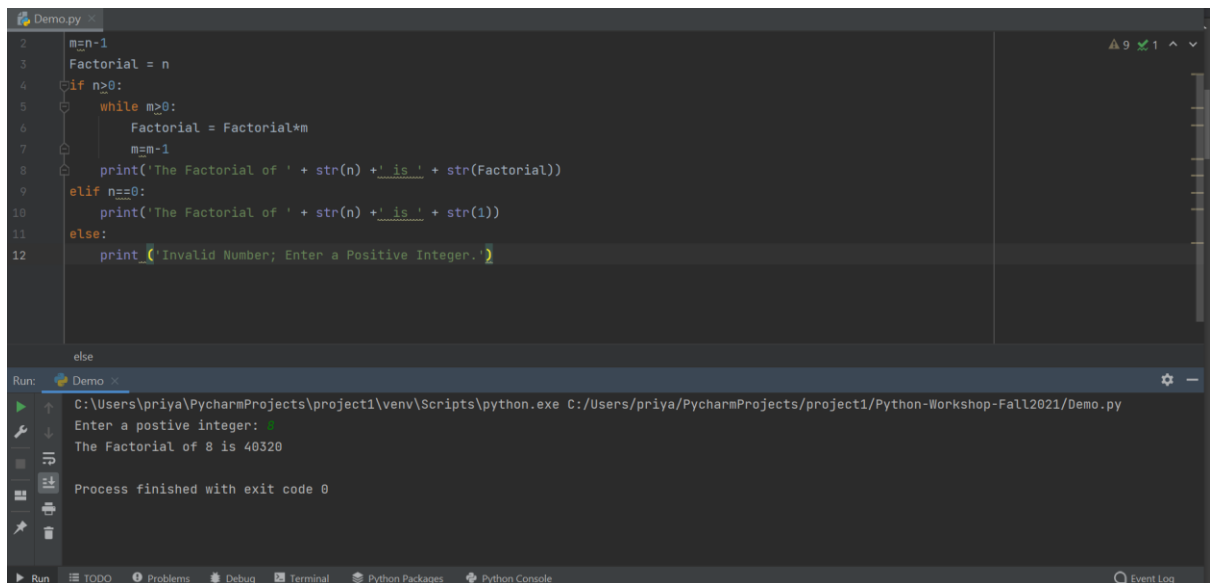
The screenshot shows the PyCharm IDE with a file named 'Demo.py'. The code in the editor is as follows:

```
1 i = 2000
2 List = []
3 #Loop to find desired numbers b/w 2000 and 3201 (both included)
4 for i in range(2000, 3201):
5     if i % 7 == 0 and i % 5 != 0:
6         List.append(i)
7     i = i + 1
8 print(List) #Prints desired numbers
```

The Run window at the bottom shows the execution of the script. The output is a list of numbers: [2002, 2009, 2016, 2023, 2037, 2044, 2051, 2058, 2072, 2079, 2086, 2093, 2107, 2114, 2121, 2128, 2142, 2149, 2156, 2163, 2177, 2184, 2191, 2198, 2205, 2212, 2219, 2233, 2240, 2247, 2254, 2268, 2275, 2282, 2289, 2303, 2310, 2317, 2324, 2338, 2345, 2352, 2366, 2373, 2380, 2387, 2401, 2408, 2415, 2422, 2436, 2443, 2450, 2457, 2471, 2478, 2485, 2492, 2506, 2513, 2520, 2527, 2541, 2548, 2555, 2562, 2576, 2583, 2590, 2597, 2611, 2618, 2625, 2632, 2646, 2653, 2660, 2667, 2681, 2688, 2695, 2702, 2709, 2716, 2723, 2737, 2744, 2751, 2758, 2772, 2779, 2786, 2793, 2807, 2814, 2821, 2828, 2842, 2849, 2856, 2863, 2877, 2884, 2891, 2898, 2912, 2919, 2926, 2933, 2940, 2947, 2961, 2968, 2975, 2982, 2996, 3003, 3010, 3017, 3024, 3038, 3045, 3052, 3059, 3073, 3080, 3087, 3094, 3108, 3115, 3122, 3129, 3143, 3150, 3157, 3164, 3178, 3185, 3192, 3199, 3213, 3220, 3227, 3234, 3248, 3255, 3262, 3269, 3283, 3290, 3297, 3304, 3318, 3325, 3332, 3346, 3353, 3360, 3367, 3381, 3388, 3395, 3402, 3416, 3423, 3430, 3437, 3451, 3458, 3465, 3472, 3486, 3493, 3500, 3507, 3521, 3528, 3535, 3542, 3556, 3563, 3570, 3577, 3591, 3598, 3605, 3612, 3626, 3633, 3640, 3647, 3661, 3668, 3675, 3682, 3696, 3703, 3710, 3717, 3731, 3738, 3745, 3752, 3766, 3773, 3780, 3787, 3801, 3808, 3815, 3822, 3836, 3843, 3850, 3857, 3871, 3878, 3885, 3892, 3906, 3913, 3920, 3927, 3941, 3948, 3955, 3962, 3976, 3983, 3990, 3997, 4011, 4018, 4025, 4032, 4046, 4053, 4060, 4067, 4081, 4088, 4095, 4102, 4116, 4123, 4130, 4137, 4151, 4158, 4165, 4172, 4186, 4193, 4200, 4207, 4221, 4228, 4235, 4242, 4256, 4263, 4270, 4277, 4291, 4298, 4305, 4312, 4326, 4333, 4340, 4347, 4361, 4368, 4375, 4382, 4396, 4403, 4410, 4417, 4431, 4438, 4445, 4452, 4466, 4473, 4480, 4487, 4501, 4508, 4515, 4522, 4536, 4543, 4550, 4557, 4571, 4578, 4585, 4592, 4606, 4613, 4620, 4627, 4641, 4648, 4655, 4662, 4676, 4683, 4690, 4697, 4711, 4718, 4725, 4732, 4746, 4753, 4760, 4767, 4781, 4788, 4795, 4802, 4816, 4823, 4830, 4837, 4851, 4858, 4865, 4872, 4886, 4893, 4900, 4907, 4921, 4928, 4935, 4942, 4956, 4963, 4970, 4977, 4991, 4998, 5005, 5012, 5026, 5033, 5040, 5047, 5061, 5068, 5075, 5082, 5096, 5103, 5110, 5117, 5131, 5138, 5145, 5152, 5166, 5173, 5180, 5187, 5201, 5208, 5215, 5222, 5236, 5243, 5250, 5257, 5271, 5278, 5285, 5292, 5306, 5313, 5320, 5327, 5341, 5348, 5355, 5362, 5376, 5383, 5390, 5397, 5411, 5418, 5425, 5432, 5446, 5453, 5460, 5467, 5481, 5488, 5495, 5502, 5516, 5523, 5530, 5537, 5551, 5558, 5565, 5572, 5586, 5593, 5600, 5607, 5621, 5628, 5635, 5642, 5656, 5663, 5670, 5677, 5691, 5698, 5705, 5712, 5726, 5733, 5740, 5747, 5761, 5768, 5775, 5782, 5796, 5803, 5810, 5817, 5831, 5838, 5845, 5852, 5866, 5873, 5880, 5887, 5901, 5908, 5915, 5922, 5936, 5943, 5950, 5957, 5971, 5978, 5985, 5992, 6006, 6013, 6020, 6027, 6041, 6048, 6055, 6062, 6076, 6083, 6090, 6097, 6111, 6118, 6125, 6132, 6146, 6153, 6160, 6167, 6181, 6188, 6195, 6202, 6216, 6223, 6230, 6237, 6251, 6258, 6265, 6272, 6286, 6293, 6300, 6307, 6321, 6328, 6335, 6342, 6356, 6363, 6370, 6377, 6391, 6398, 6405, 6412, 6426, 6433, 6440, 6447, 6461, 6468, 6475, 6482, 6496, 6503, 6510, 6517, 6531, 6538, 6545, 6552, 6566, 6573, 6580, 6587, 6601, 6608, 6615, 6622, 6636, 6643, 6650, 6657, 6671, 6678, 6685, 6692, 6706, 6713, 6720, 6727, 6741, 6748, 6755, 6762, 6776, 6783, 6790, 6797, 6811, 6818, 6825, 6832, 6846, 6853, 6860, 6867, 6881, 6888, 6895, 6902, 6916, 6923, 6930, 6937, 6951, 6958, 6965, 6972, 6986, 6993, 7000, 7007, 7021, 7028, 7035, 7042, 7056, 7063, 7070, 7077, 7091, 7098, 7105, 7112, 7126, 7133, 7140, 7147, 7161, 7168, 7175, 7182, 7196, 7203, 7210, 7217, 7231, 7238, 7245, 7252, 7266, 7273, 7280, 7287, 7301, 7308, 7315, 7322, 7336, 7343, 7350, 7357, 7371, 7378, 7385, 7392, 7406, 7413, 7420, 7427, 7441, 7448, 7455, 7462, 7476, 7483, 7490, 7497, 7511, 7518, 7525, 7532, 7546, 7553, 7560, 7567, 7581, 7588, 7595, 7602, 7616, 7623, 7630, 7637, 7651, 7658, 7665, 7672, 7686, 7693, 7700, 7707, 7721, 7728, 7735, 7742, 7756, 7763, 7770, 7777, 7791, 7798, 7805, 7812, 7826, 7833, 7840, 7847, 7861, 7868, 7875, 7882, 7896, 7903, 7910, 7917, 7931, 7938, 7945, 7952, 7966, 7973, 7980, 7987, 8001, 8008, 8015, 8022, 8036, 8043, 8050, 8057, 8071, 8078, 8085, 8092, 8106, 8113, 8120, 8127, 8141, 8148, 8155, 8162, 8176, 8183, 8190, 8197, 8211, 8218, 8225, 8232, 8246, 8253, 8260, 8267, 8281, 8288, 8295, 8302, 8316, 8323, 8330, 8337, 8351, 8358, 8365, 8372, 8386, 8393, 8400, 8407, 8421, 8428, 8435, 8442, 8456, 8463, 8470, 8477, 8491, 8498, 8505, 8512, 8526, 8533, 8540, 8547, 8561, 8568, 8575, 8582, 8596, 8603, 8610, 8617, 8631, 8638, 8645, 8652, 8666, 8673, 8680, 8687, 8701, 8708, 8715, 8722, 8736, 8743, 8750, 8757, 8771, 8778, 8785, 8792, 8806, 8813, 8820, 8827, 8841, 8848, 8855, 8862, 8876, 8883, 8890, 8897, 8911, 8918, 8925, 8932, 8946, 8953, 8960, 8967, 8981, 8988, 8995, 9002, 9016, 9023, 9030, 9037, 9051, 9058, 9065, 9072, 9086, 9093, 9100, 9107, 9121, 9128, 9135, 9142, 9156, 9163, 9170, 9177, 9184, 9191, 9205, 9212, 9219, 9226, 9240, 9247, 9254, 9261, 9275, 9282, 9289, 9296, 9310, 9317, 9324, 9331, 9345, 9352, 9359, 9366, 9380, 9387, 9394, 9401, 9415, 9422, 9429, 9436, 9450, 9457, 9464, 9471, 9485, 9492, 9499, 9506, 9520, 9527, 9534, 9541, 9555, 9562, 9569, 9576, 9590, 9597, 9604, 9611, 9625, 9632, 9639, 9646, 9660, 9667, 9674, 9681, 9695, 9702, 9709, 9716, 9730, 9737, 9744, 9751, 9765, 9772, 9779, 9786, 9800, 9807, 9814, 9821, 9835, 9842, 9849, 9856, 9870, 9877, 9884, 9891, 9905, 9912, 9919, 9926, 9940, 9947, 9954, 9961, 9975, 9982, 9989, 10000].

The Run window shows the command: C:\Users\priya\PycharmProjects\project1\venv\Scripts\python.exe C:/Users/priya/PycharmProjects/project1/Python-Workshop-Fall2021/Demo.py. The output is: [2002, 2009, 2016, 2023, 2037, 2044, 2051, 2058, 2072, 2079, 2086, 2093, 2107, 2114, 2121, 2128, 2142, 2149, 2156, 2163, 2177, 2184, 2191, 2198, 2205, 2212, 2219, 2233, 2240, 2247, 2254, 2268, 2275, 2282, 2289, 2303, 2310, 2317, 2324, 2338, 2345, 2352, 2366, 2373, 2380, 2387, 2401, 2408, 2415, 2422, 2436, 2443, 2450, 2457, 2471, 2478, 2485, 2492, 2506, 2513, 2520, 2527, 2541, 2548, 2555, 2562, 2576, 2583, 2590, 2597, 2611, 2618, 2625, 2632, 2646, 2653, 2660, 2667, 2681, 2688, 2695, 2702, 2709, 2716, 2723, 2737, 2744, 2751, 2758, 2772, 2779, 2786, 2793, 2807, 2814, 2821, 2828, 2842, 2849, 2856, 2863, 2877, 2884, 2891, 2898, 2912, 2919, 2926, 2933, 2940, 2947, 2961, 2968, 2975, 2982, 2996, 3003, 3010, 3017, 3024, 3038, 3045, 3052, 3059, 3073, 3080, 3087, 3094, 3108, 3115, 3122, 3129, 3143, 3150, 3157, 3164, 3178, 3185, 3192, 3199, 3213, 3220, 3227, 3234, 3248, 3255, 3262, 3269, 3283, 3290, 3297, 3304, 3318, 3325, 3332, 3346, 3353, 3360, 3367, 3381, 3388, 3395, 3402, 3416, 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7777, 7791, 7798, 7805, 7812, 7826, 7833, 7840, 7847, 7861, 7868, 7875, 7882, 7896, 7903, 7910, 7917, 7931, 7938, 7945, 7952, 7966, 7973, 7980, 7987, 8001, 8008, 8015, 8022, 8036, 8043, 8050, 8057, 8071, 8078, 8085, 8092, 8106, 8113, 8120, 8127, 8141, 8148, 8155, 8162, 8176, 8183, 8190, 8197, 8211, 8218, 8225, 8232, 8246, 8253, 8260, 8267, 8281, 8288, 8295, 8302, 8316, 8323, 8330, 8337, 8351, 8358, 8365, 8372, 8386, 8393, 8400, 8407, 8421, 8428, 8435, 8442, 8456, 8463, 8470, 8477, 8491, 8498, 8505, 8512, 8526, 8533, 8540, 8547, 8561, 8568, 8575, 8582, 8596, 8603, 8610, 8617, 8631, 8638, 8645, 8652, 8666, 8673, 8680, 8687, 8701, 8708, 8715, 8722, 8736, 8743, 8750, 8757, 8771, 8778, 8785, 8792, 8806, 8813, 8820, 8827, 8841, 8848, 8855, 8862, 8876, 8883, 8890, 8897, 8911, 8918, 8925, 8932, 8946, 8953, 8960, 8967, 8981, 8988, 8995, 9002, 9016, 9023, 9030, 9037, 9051, 9058, 9065, 9072, 9086, 9093, 9100, 9107, 9121, 9128, 9135, 9142, 9156, 9163, 9170, 9177, 9191, 9198, 9205, 9212, 9226, 9233, 9240, 9247, 9261, 9268, 9275, 9282, 9296, 9303, 9310, 9317, 9331, 9338, 9345, 9352, 9366, 9373, 9380, 9387, 9401, 9408, 9415, 9422, 9436, 9443, 9450, 9457, 9471, 9478, 9485, 9492, 9506, 9513, 9520, 9527, 9541, 9548, 9555, 9562, 9576, 9583, 9590, 9597, 9611, 9618, 9625, 9632, 9646, 9653, 9660, 9667, 9681, 9688, 9695, 9702, 9716, 9723, 9730, 9737, 9751, 9758, 9765, 9772, 9786, 9793, 9800, 9807, 9821, 9828, 9835, 9842, 9856, 9863, 9870, 9877, 9891, 9898, 9905, 9912, 9926, 9933, 9940, 9947, 9961, 9968, 9975, 9982, 9996, 10000].

Question 2)

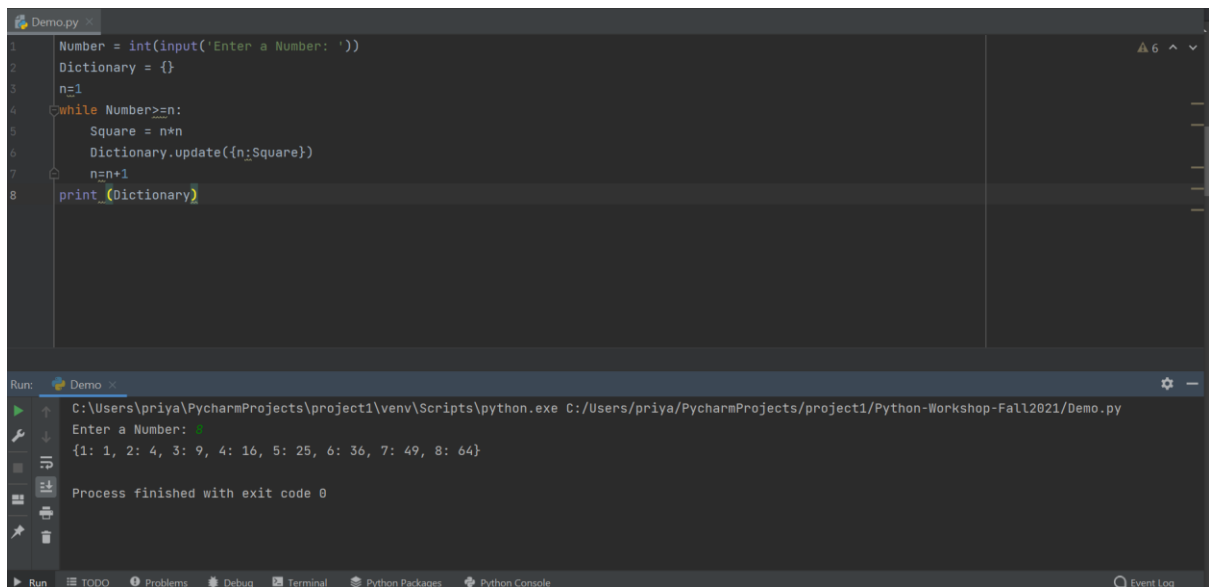


The screenshot shows the PyCharm IDE with a file named 'Demo.py'. The code in the editor is as follows:

```
2 m=n-1
3 Factorial = n
4 if n>0:
5     while m>0:
6         Factorial = Factorial*m
7         m=m-1
8     print('The Factorial of ' + str(n) + ' is ' + str(Factorial))
9 elif n==0:
10    print('The Factorial of ' + str(n) + ' is ' + str(1))
11 else:
12    print('Invalid Number; Enter a Positive Integer.')
```

The Run window at the bottom shows the execution of the script. The output is: Enter a positive integer: 8. The Factorial of 8 is 40320.

Question 3)

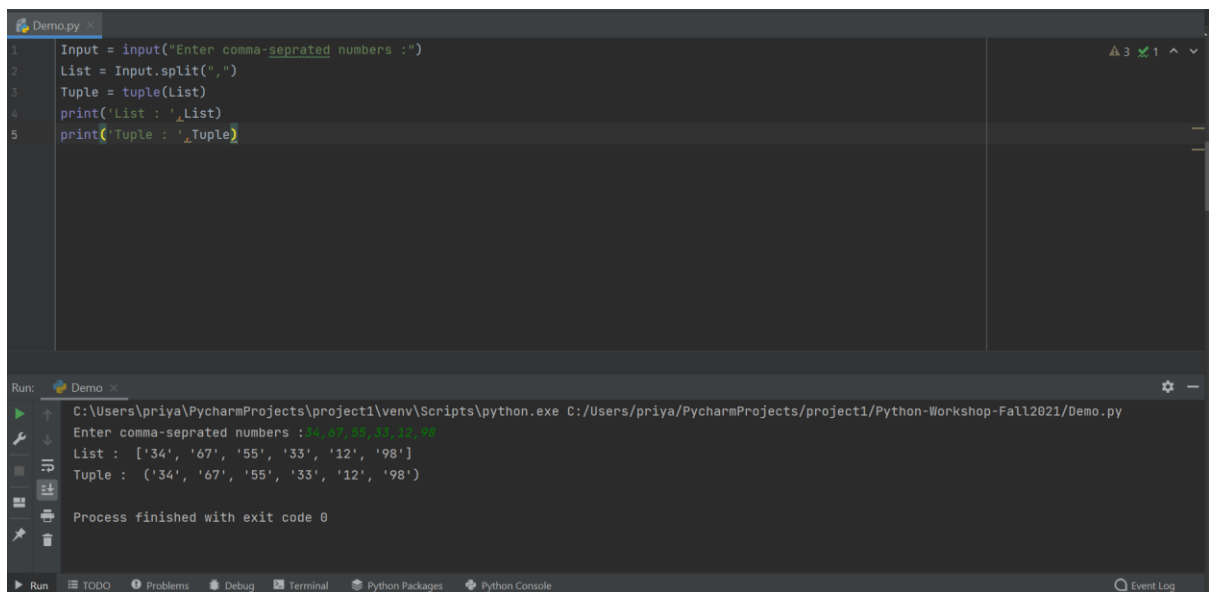


The screenshot shows the PyCharm IDE with a file named `Demo.py`. The code in the editor is as follows:

```
1 Number = int(input('Enter a Number: '))
2 Dictionary = {}
3 n=1
4 while Number >= n:
5     Square = n*n
6     Dictionary.update({n:Square})
7     n=n+1
8 print(Dictionary)
```

The Run window at the bottom shows the execution of the script. The command executed is `C:\Users\priya\PycharmProjects\project1\venv\Scripts\python.exe C:/Users/priya/PycharmProjects/project1/Python-Workshop-Fall2021/Demo.py`. The input provided is `Enter a Number: 6`, and the output is `{1: 1, 2: 4, 3: 9, 4: 16, 5: 25, 6: 36, 7: 49, 8: 64}`. The process finished with exit code 0.

Question 4)

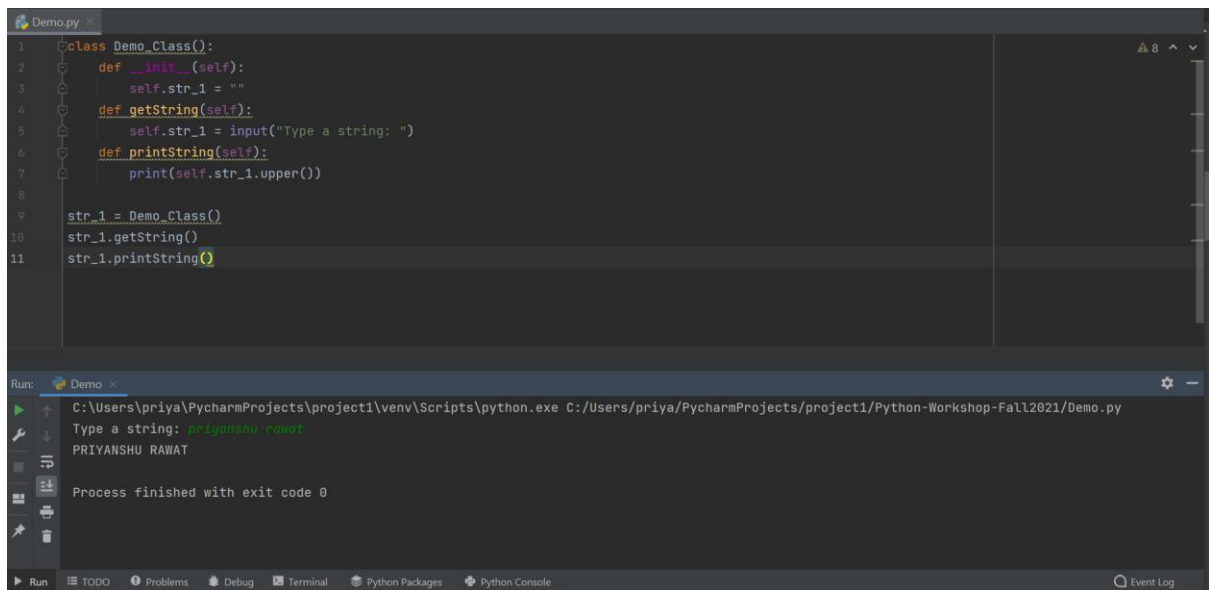


The screenshot shows the PyCharm IDE with a file named `Demo.py`. The code in the editor is as follows:

```
1 Input = input("Enter comma-seprated numbers :")
2 List = Input.split(",")
3 Tuple = tuple(List)
4 print('List : ',List)
5 print('Tuple : ',Tuple)
```

The Run window at the bottom shows the execution of the script. The command executed is `C:\Users\priya\PycharmProjects\project1\venv\Scripts\python.exe C:/Users/priya/PycharmProjects/project1/Python-Workshop-Fall2021/Demo.py`. The input provided is `Enter comma-seprated numbers :34,67,55,33,12,98`. The output is `List : ['34', '67', '55', '33', '12', '98']` and `Tuple : ('34', '67', '55', '33', '12', '98')`. The process finished with exit code 0.

Question 5)



```
1 class Demo_Class():
2     def __init__(self):
3         self.str_1 = ""
4     def getString(self):
5         self.str_1 = input("Type a string: ")
6     def printString(self):
7         print(self.str_1.upper())
8
9 str_1 = Demo_Class()
10 str_1.getString()
11 str_1.printString()
```

Run: Demo

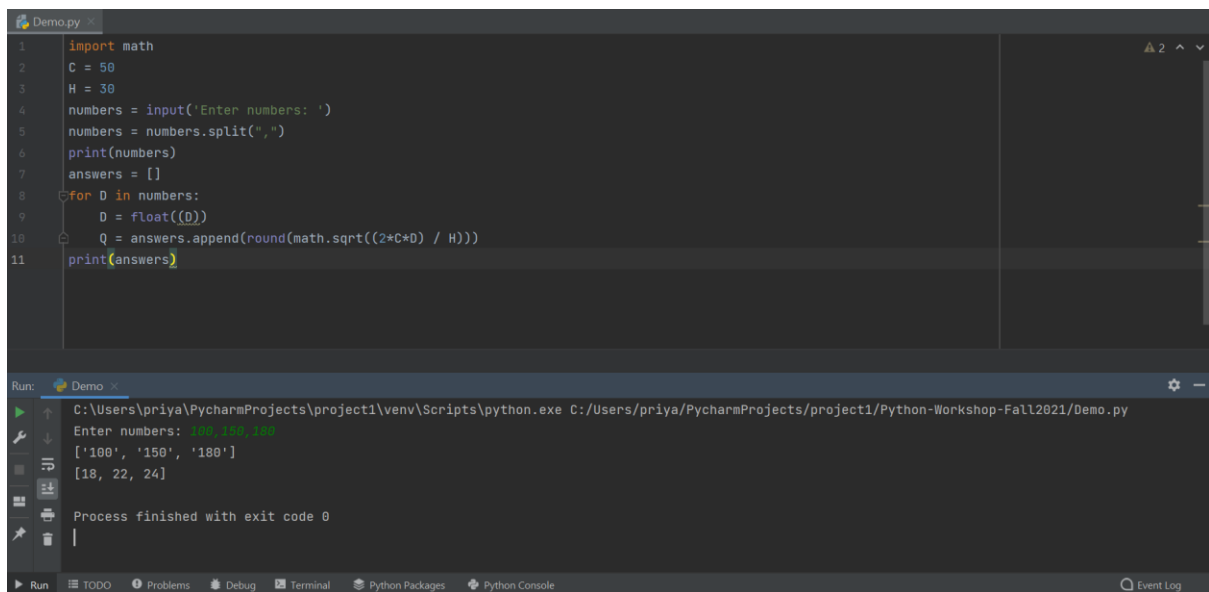
C:\Users\priya\PycharmProjects\project1\venv\Scripts\python.exe C:/Users/priya/PycharmProjects/project1/Python-Workshop-Fall2021/Demo.py

Type a string: priyanshu rawat

PRIYANSHU RAWAT

Process finished with exit code 0

Question 6)



```
1 import math
2 C = 50
3 H = 30
4 numbers = input('Enter numbers: ')
5 numbers = numbers.split(",")
6 print(numbers)
7 answers = []
8 for D in numbers:
9     D = float(D)
10    Q = answers.append(round(math.sqrt((2*C*D) / H)))
11 print(answers)
```

Run: Demo

C:\Users\priya\PycharmProjects\project1\venv\Scripts\python.exe C:/Users/priya/PycharmProjects/project1/Python-Workshop-Fall2021/Demo.py

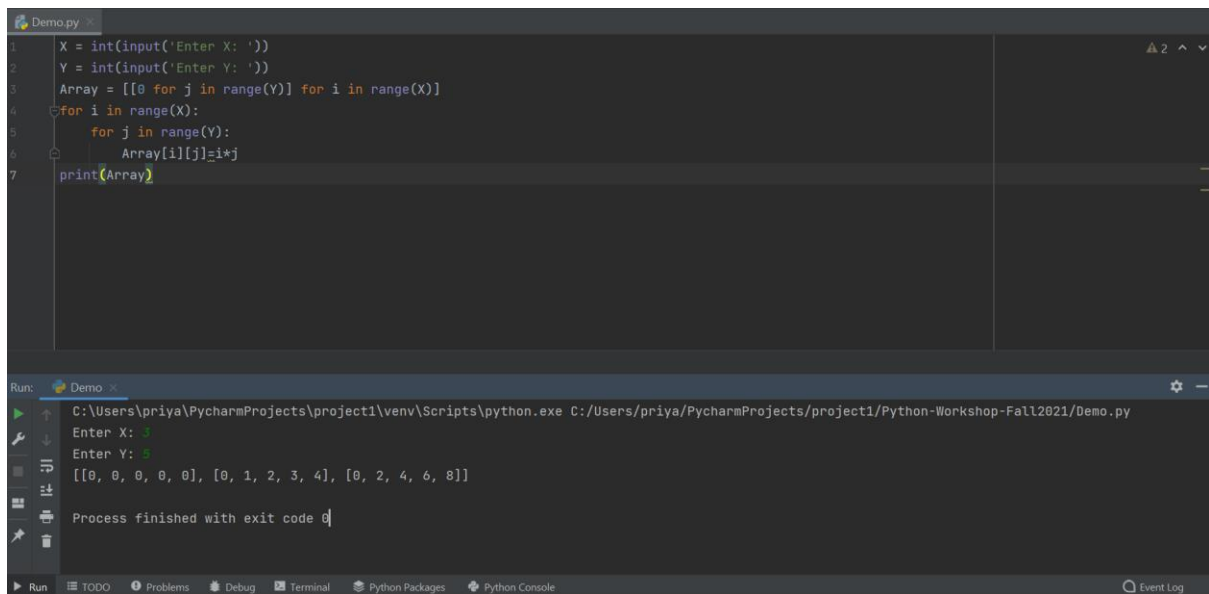
Enter numbers: 100,150,180

['100', '150', '180']

[18, 22, 24]

Process finished with exit code 0

Question 7)



The screenshot shows the PyCharm IDE with a file named `Demo.py`. The code in the editor is as follows:

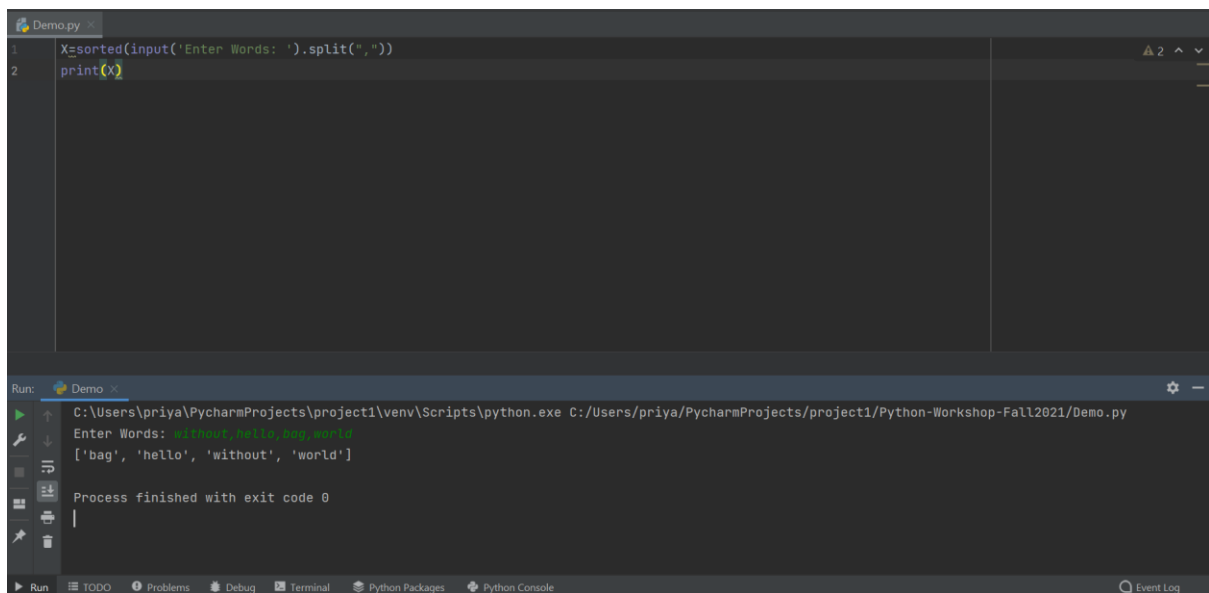
```
1 X = int(input('Enter X: '))
2 Y = int(input('Enter Y: '))
3 Array = [[0 for j in range(Y)] for i in range(X)]
4 for i in range(X):
5     for j in range(Y):
6         Array[i][j] = i*j
7 print(Array)
```

The Run window at the bottom shows the execution of the script. The command used is `C:\Users\priya\PycharmProjects\project1\venv\Scripts\python.exe C:/Users/priya/PycharmProjects/project1/Python-Workshop-Fall2021/Demo.py`. The input values are `Enter X: 3` and `Enter Y: 5`. The output is a 3x5 matrix of products:

```
[[0, 0, 0, 0, 0], [0, 1, 2, 3, 4], [0, 2, 4, 6, 8]]
```

The process finished with exit code 0.

Question 8)



The screenshot shows the PyCharm IDE with a file named `Demo.py`. The code in the editor is as follows:

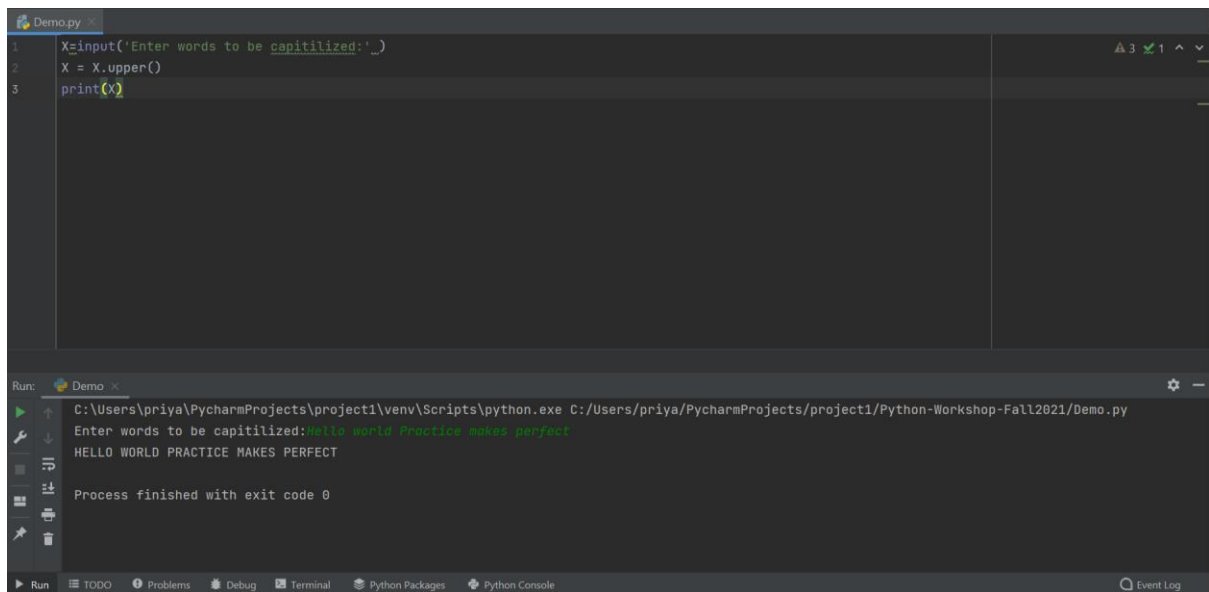
```
1 X=sorted(input('Enter Words: ').split(","))
2 print(X)
```

The Run window at the bottom shows the execution of the script. The command used is `C:\Users\priya\PycharmProjects\project1\venv\Scripts\python.exe C:/Users/priya/PycharmProjects/project1/Python-Workshop-Fall2021/Demo.py`. The input is `Enter Words: without,hello,bag,world`. The output is a sorted list of words:

```
['bag', 'hello', 'without', 'world']
```

The process finished with exit code 0.

Question 9)

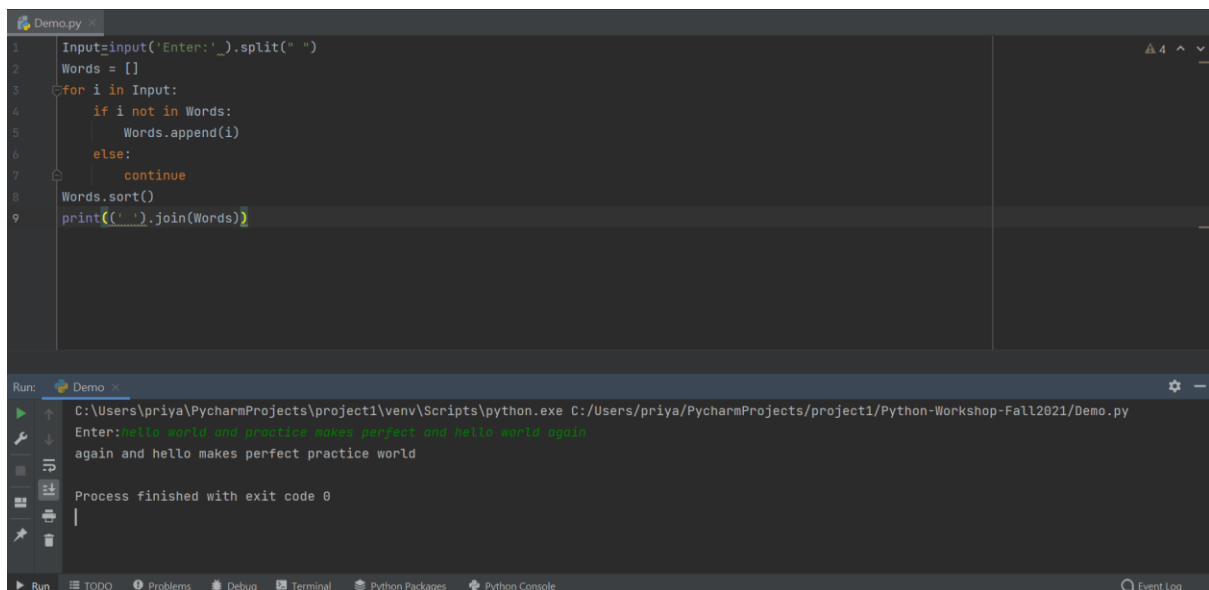


The screenshot shows the PyCharm IDE with a file named `Demo.py`. The code in the editor is as follows:

```
1 X=input('Enter words to be capitilized:')
2 X = X.upper()
3 print(X)
```

The Run window at the bottom shows the execution of the script. The command used is `C:\Users\priya\PycharmProjects\project1\venv\Scripts\python.exe C:/Users/priya/PycharmProjects/project1/Python-Workshop-Fall2021/Demo.py`. The input provided was `Enter words to be capitilized:Hello world Practice makes perfect`. The output of the script is `HELLO WORLD PRACTICE MAKES PERFECT`. The process finished with exit code 0.

Question 10)

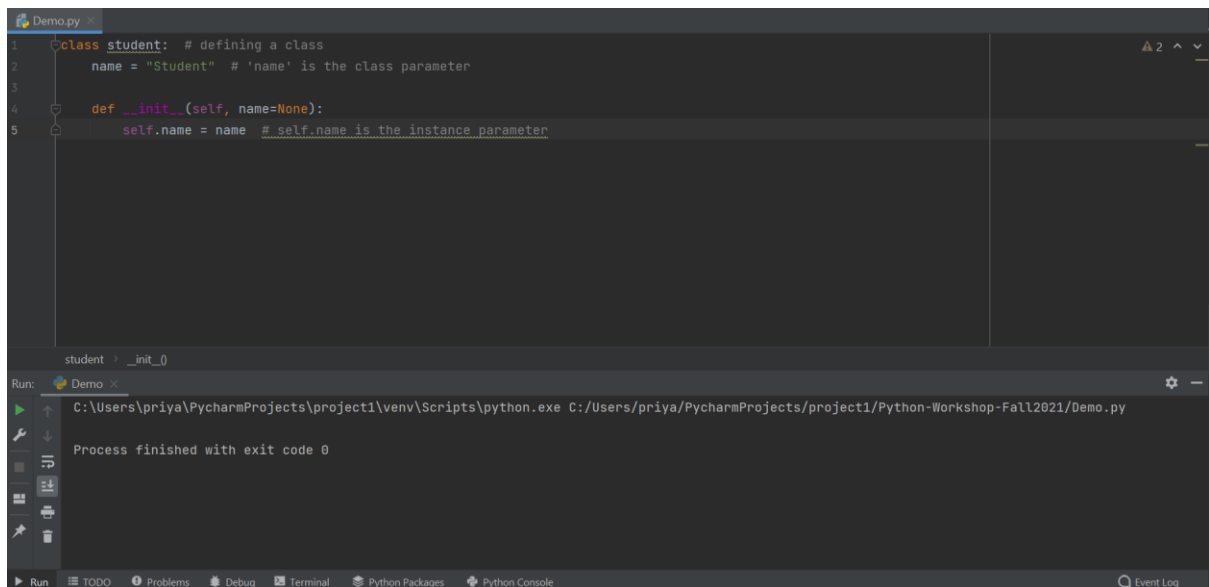


The screenshot shows the PyCharm IDE with a file named `Demo.py`. The code in the editor is as follows:

```
1 Input=input('Enter:').split(" ")
2 Words = []
3 for i in Input:
4     if i not in Words:
5         Words.append(i)
6     else:
7         continue
8 Words.sort()
9 print(' '.join(Words))
```

The Run window at the bottom shows the execution of the script. The command used is `C:\Users\priya\PycharmProjects\project1\venv\Scripts\python.exe C:/Users/priya/PycharmProjects/project1/Python-Workshop-Fall2021/Demo.py`. The input provided was `Enter:hello world and practice makes perfect and hello world again`. The output of the script is `again and hello makes perfect practice world`. The process finished with exit code 0.

Question 25)

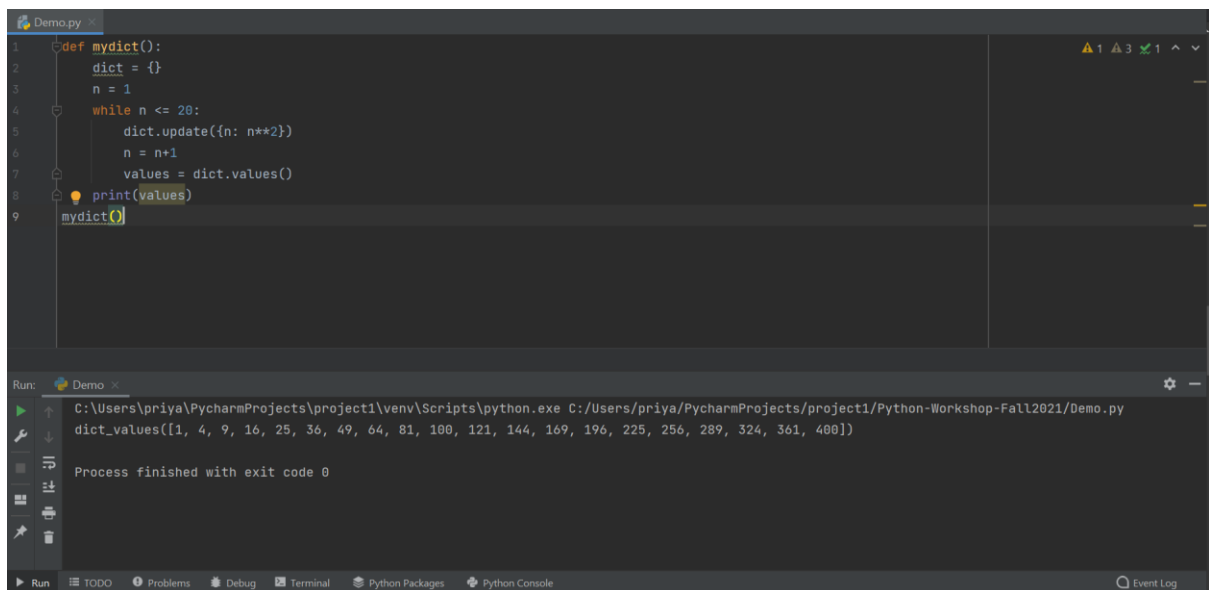


The screenshot shows the PyCharm IDE with a file named `Demo.py`. The code defines a class `student` with a class attribute `name = "Student"` and an `__init__` method that sets `self.name = name`. The run console shows the process finished with exit code 0.

```
1 class student: # defining a class
2     name = "Student" # 'name' is the class parameter
3
4     def __init__(self, name=None):
5         self.name = name # self.name is the instance parameter
```

Run: Demo
C:\Users\priya\PycharmProjects\project1\venv\Scripts\python.exe C:/Users/priya/PycharmProjects/project1/Python-Workshop-Fall2021/Demo.py
Process finished with exit code 0

Question 35)

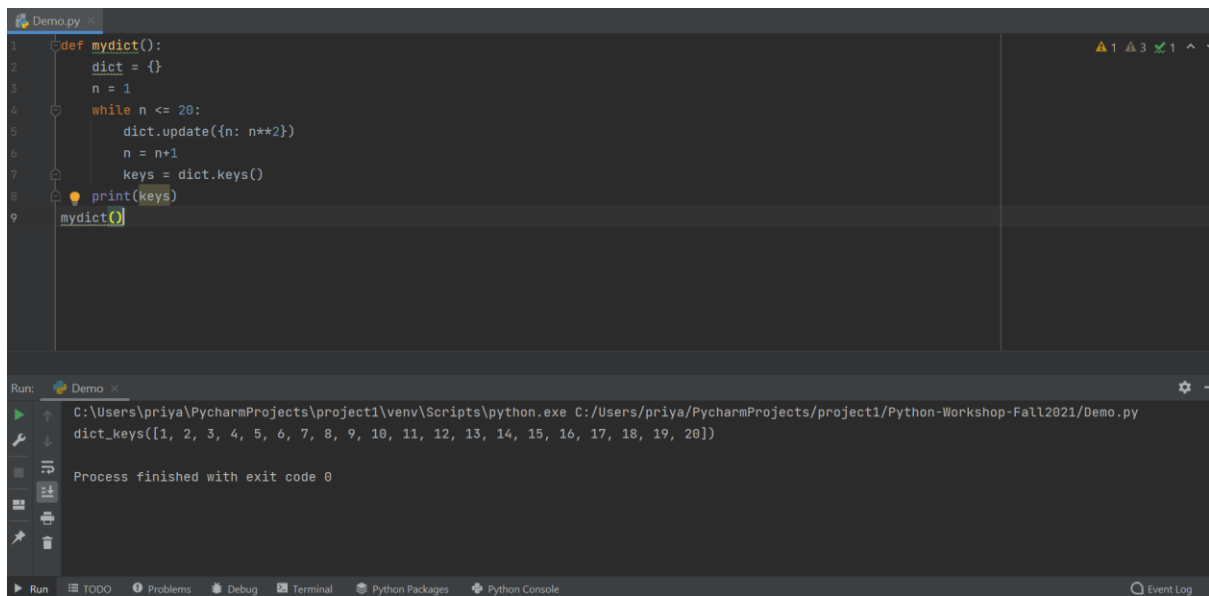


The screenshot shows the PyCharm IDE with a file named `Demo.py`. The code defines a function `mydict()` that creates a dictionary, updates it with values from 1 to 20 squared, and prints the values. The run console shows the output of the function and the process finished with exit code 0.

```
1 def mydict():
2     dict = {}
3     n = 1
4     while n <= 20:
5         dict.update({n: n**2})
6         n = n+1
7         values = dict.values()
8     print(values)
9 mydict()
```

Run: Demo
C:\Users\priya\PycharmProjects\project1\venv\Scripts\python.exe C:/Users/priya/PycharmProjects/project1/Python-Workshop-Fall2021/Demo.py
dict_values([1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225, 256, 289, 324, 361, 400])
Process finished with exit code 0

Question 36)

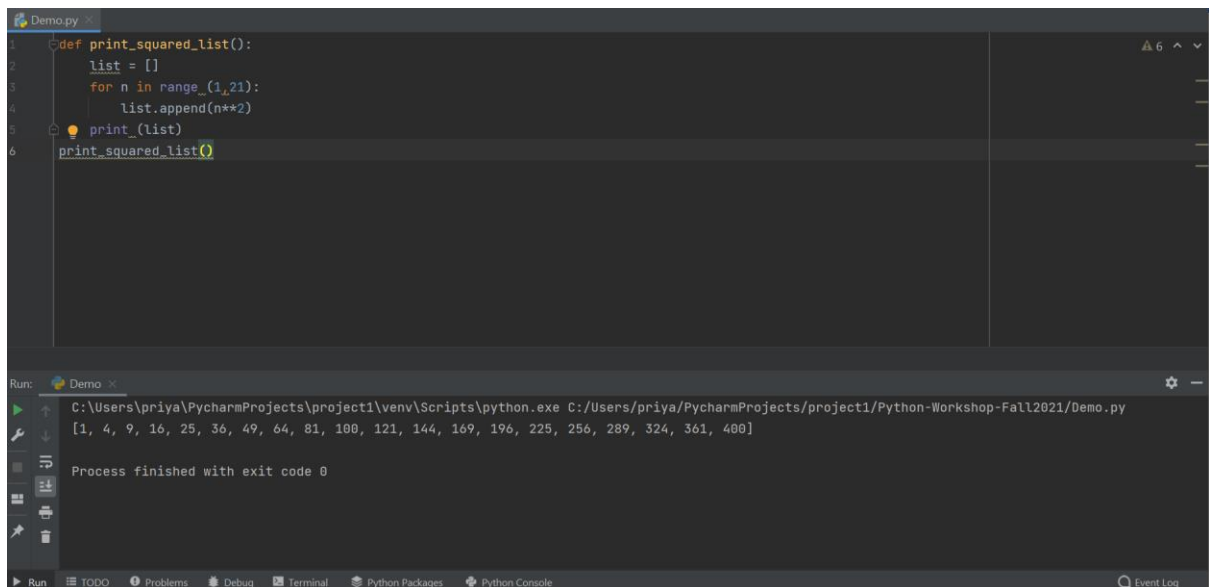


The screenshot shows the PyCharm IDE with a file named `Demo.py`. The code defines a function `mydict()` that creates an empty dictionary, initializes `n` to 1, and enters a `while` loop that runs while `n` is less than or equal to 20. Inside the loop, the dictionary is updated with the key `n` and value `n*2`, `n` is incremented by 1, and the keys of the dictionary are printed. After the loop, the function is called.

```
1 def mydict():
2     dict = {}
3     n = 1
4     while n <= 20:
5         dict.update({n: n*2})
6         n = n+1
7         keys = dict.keys()
8     print(keys)
9 mydict()
```

The Run window shows the command executed: `C:\Users\priya\PycharmProjects\project1\venv\Scripts\python.exe C:/Users/priya/PycharmProjects/project1/Python-Workshop-Fall2021/Demo.py`. The output is `dict_keys([1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20])`. The process finished with exit code 0.

Question 37)

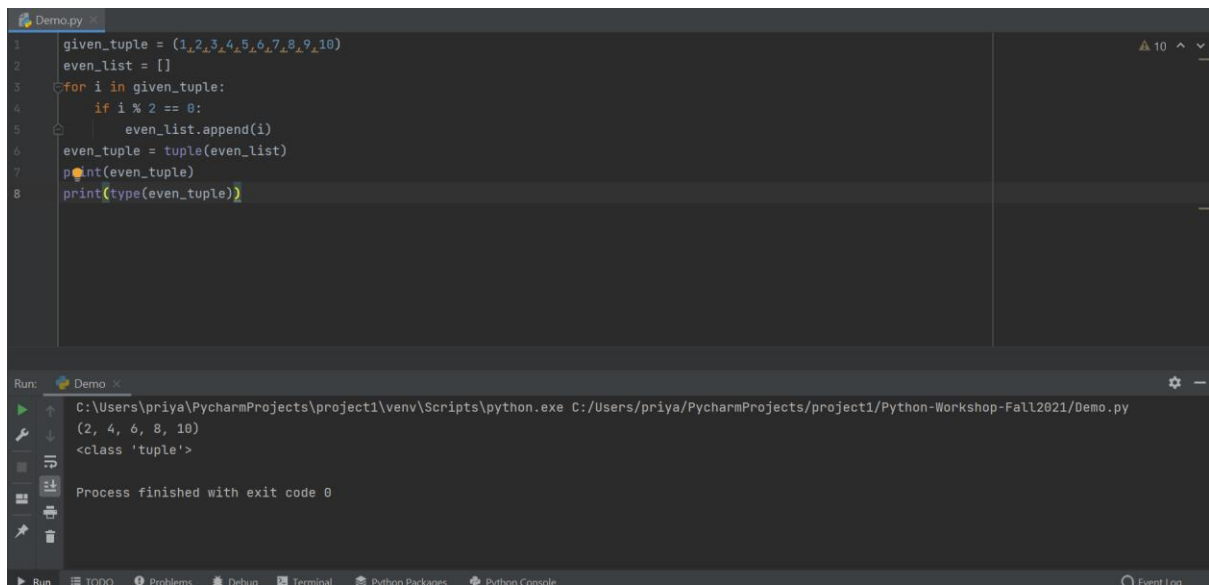


The screenshot shows the PyCharm IDE with a file named `Demo.py`. The code defines a function `print_squared_list()` that creates an empty list, iterates over the range from 1 to 21, appends the square of each number to the list, and prints the list. The function is then called.

```
1 def print_squared_list():
2     list = []
3     for n in range(1,21):
4         list.append(n*2)
5     print(list)
6 print_squared_list()
```

The Run window shows the command executed: `C:\Users\priya\PycharmProjects\project1\venv\Scripts\python.exe C:/Users/priya/PycharmProjects/project1/Python-Workshop-Fall2021/Demo.py`. The output is `[1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225, 256, 289, 324, 361, 400]`. The process finished with exit code 0.

Question 43)

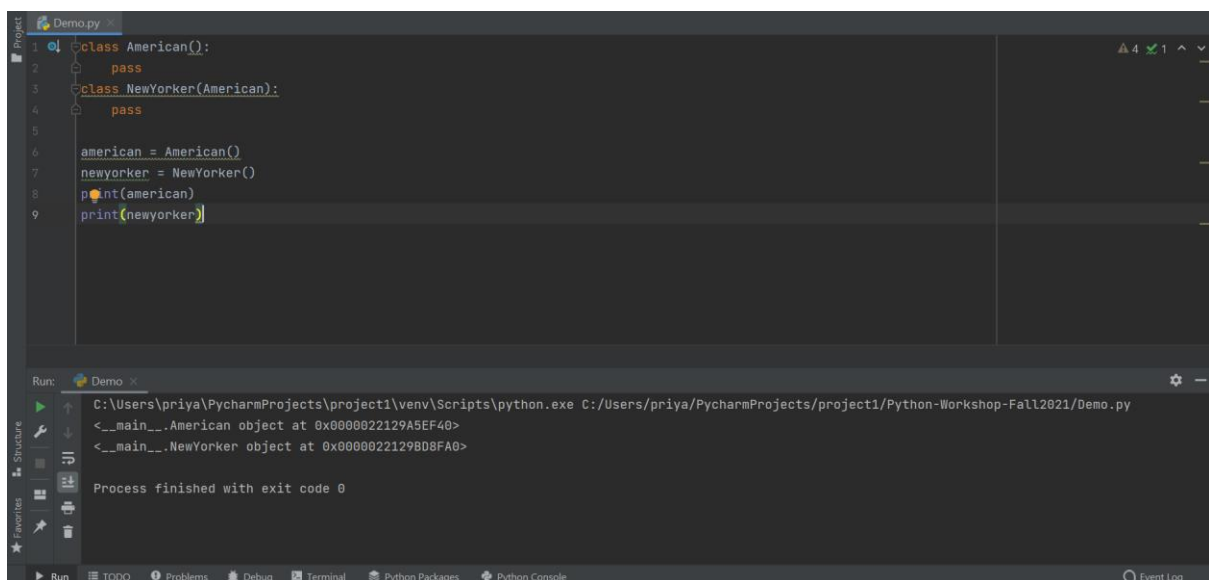


The screenshot shows the PyCharm IDE with a file named `Demo.py`. The code in the editor is as follows:

```
1 given_tuple = (1,2,3,4,5,6,7,8,9,10)
2 even_list = []
3 for i in given_tuple:
4     if i % 2 == 0:
5         even_list.append(i)
6 even_tuple = tuple(even_list)
7 print(even_tuple)
8 print(type(even_tuple))
```

The Run window at the bottom shows the execution of the script. The command executed is `C:\Users\priya\PycharmProjects\project1\venv\Scripts\python.exe C:/Users/priya/PycharmProjects/project1/Python-Workshop-Fall2021/Demo.py`. The output is `(2, 4, 6, 8, 10)` followed by `<class 'tuple'>`. The process finished with exit code 0.

Question 51)

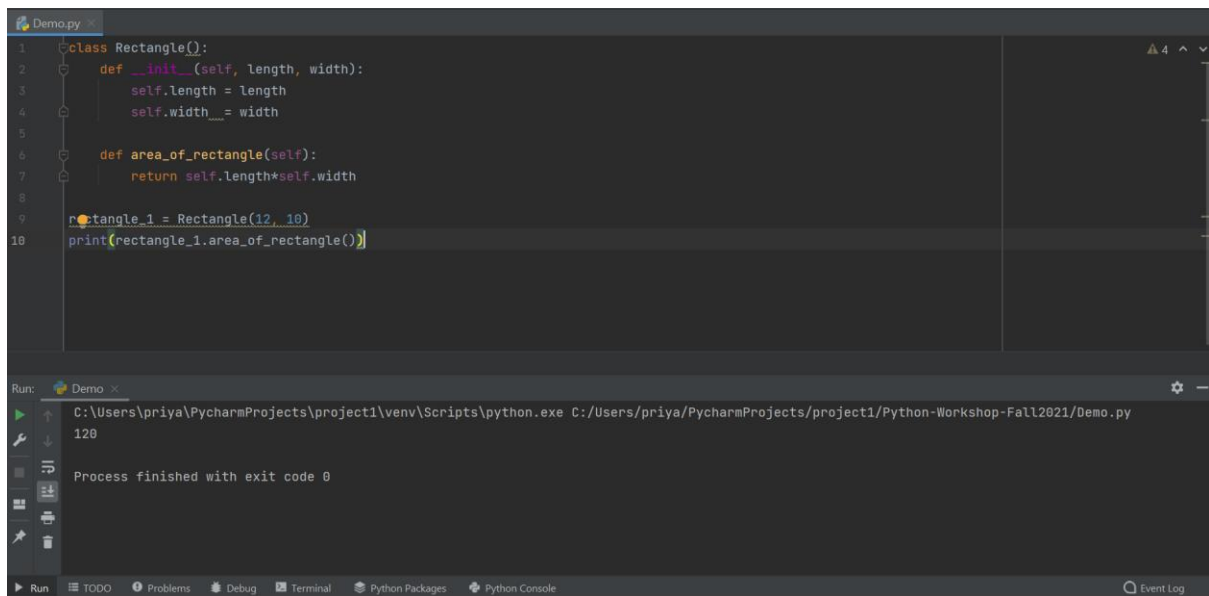


The screenshot shows the PyCharm IDE with a file named `Demo.py`. The code in the editor is as follows:

```
1 class American():
2     pass
3 class NewYorker(American):
4     pass
5
6 american = American()
7 newyorker = NewYorker()
8 print(american)
9 print(newyorker)
```

The Run window at the bottom shows the execution of the script. The command executed is `C:\Users\priya\PycharmProjects\project1\venv\Scripts\python.exe C:/Users/priya/PycharmProjects/project1/Python-Workshop-Fall2021/Demo.py`. The output is `<__main__.American object at 0x0000022129A5EF40>` followed by `<__main__.NewYorker object at 0x0000022129B08FA0>`. The process finished with exit code 0.

Question 53)



```
1 class Rectangle():
2     def __init__(self, length, width):
3         self.length = length
4         self.width = width
5
6     def area_of_rectangle(self):
7         return self.length*self.width
8
9     rectangle_1 = Rectangle(12, 10)
10    print(rectangle_1.area_of_rectangle())
```

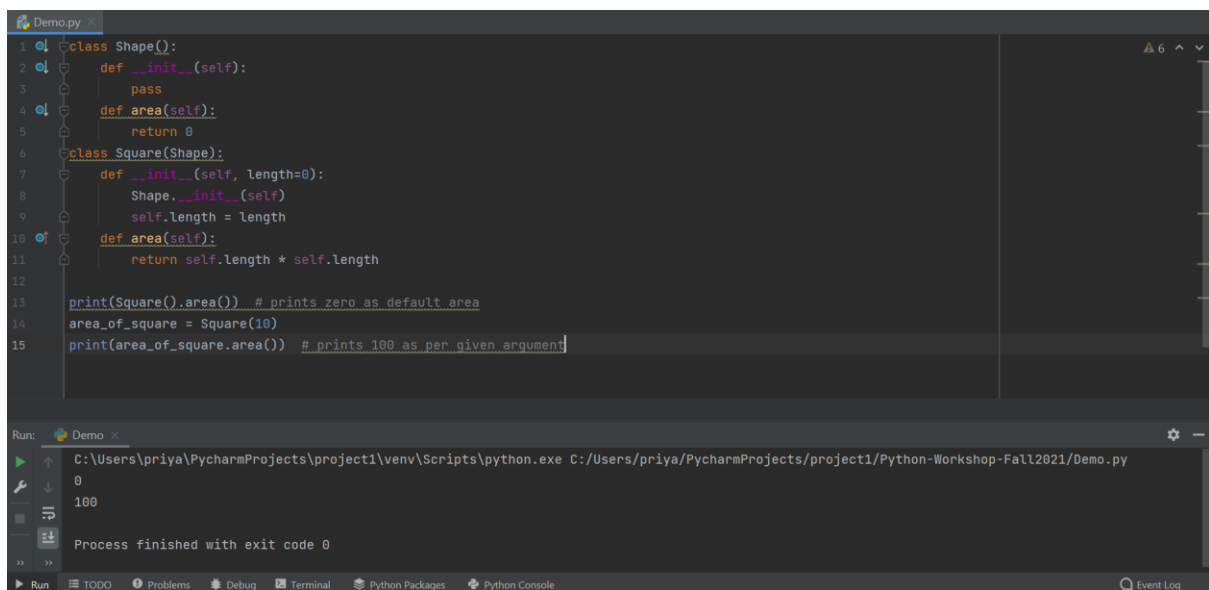
Run: Demo x

C:\Users\priya\PycharmProjects\project1\venv\Scripts\python.exe C:/Users/priya/PycharmProjects/project1/Python-Workshop-Fall2021/Demo.py
120

Process finished with exit code 0

Run | TODO | Problems | Debug | Terminal | Python Packages | Python Console | Event Log

Question 54)



```
1 class Shape():
2     def __init__(self):
3         pass
4     def area(self):
5         return 0
6
7 class Square(Shape):
8     def __init__(self, length=0):
9         Shape.__init__(self)
10        self.length = length
11    def area(self):
12        return self.length * self.length
13
14    print(Square().area()) # prints zero as default area
15    area_of_square = Square(10)
16    print(area_of_square.area()) # prints 100 as per given argument
```

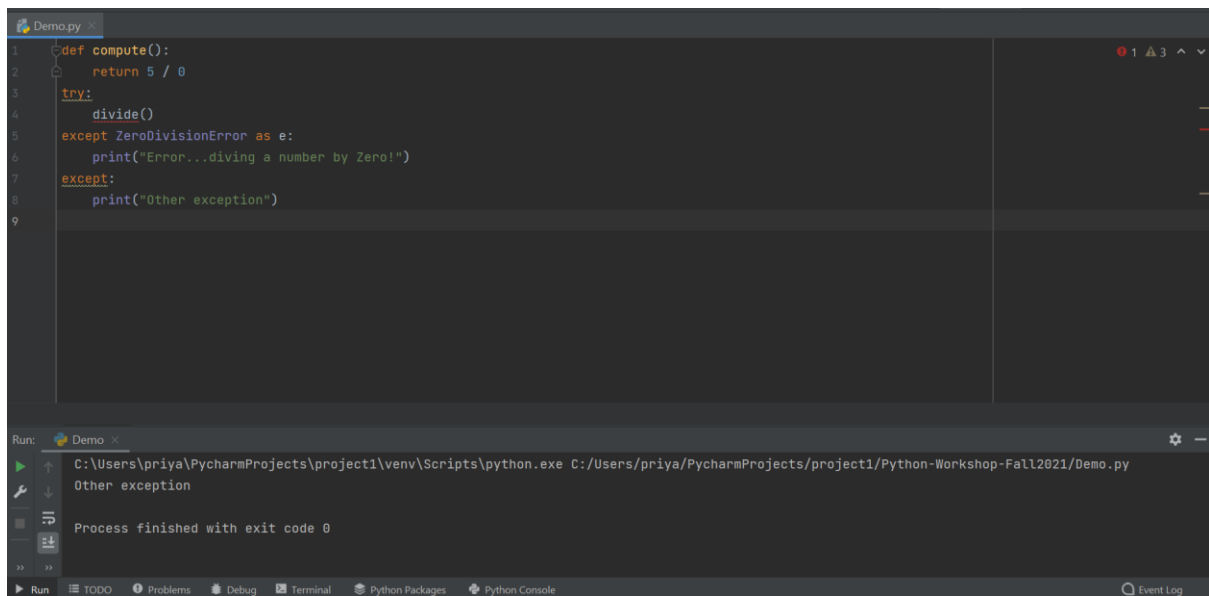
Run: Demo x

C:\Users\priya\PycharmProjects\project1\venv\Scripts\python.exe C:/Users/priya/PycharmProjects/project1/Python-Workshop-Fall2021/Demo.py
0
100

Process finished with exit code 0

Run | TODO | Problems | Debug | Terminal | Python Packages | Python Console | Event Log

Question 56)



The screenshot shows the PyCharm IDE with a file named `Demo.py`. The code defines a function `compute()` that returns `5 / 0` and is wrapped in a `try-except` block. The `try` block calls `divide()`, which triggers a `ZeroDivisionError`. The `except` block catches this error and prints `"Error...diving a number by Zero!"`. A second `except` block catches any other exceptions and prints `"Other exception"`. The Run window shows the command `C:\Users\priya\PycharmProjects\project1\venv\Scripts\python.exe C:/Users/priya/PycharmProjects/project1/Python-Workshop-Fall2021/Demo.py` and the output `Other exception`, indicating the `ZeroDivisionError` was successfully caught and handled.

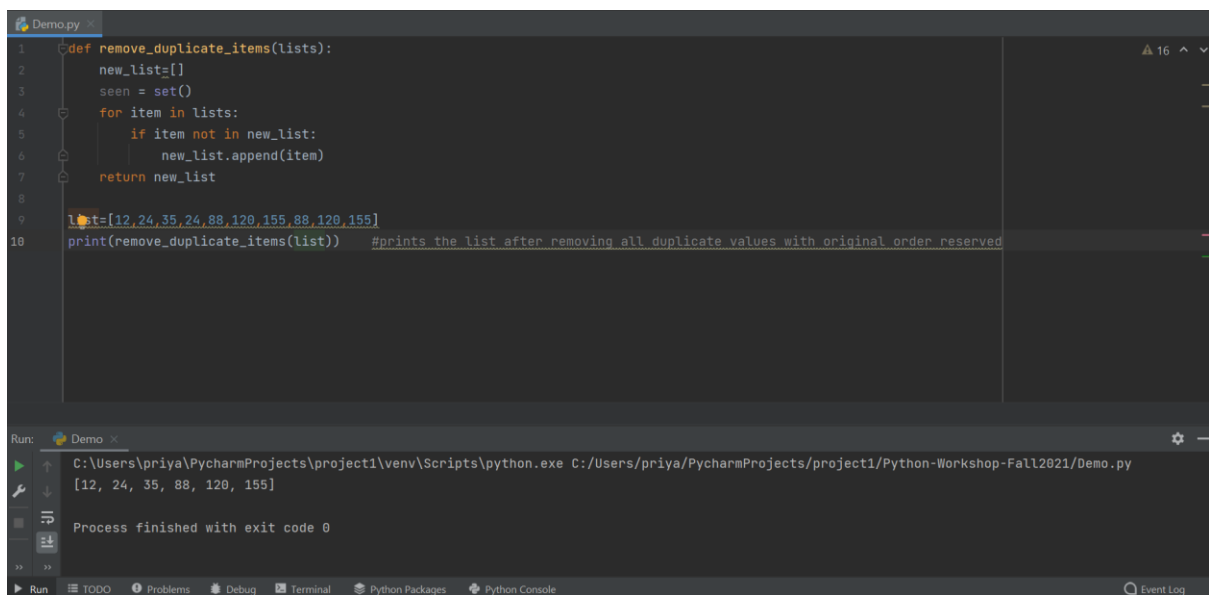
```
1 def compute():
2     return 5 / 0
3
4 try:
5     divide()
6 except ZeroDivisionError as e:
7     print("Error...diving a number by Zero!")
8 except:
9     print("Other exception")
```

Run: Demo x

C:\Users\priya\PycharmProjects\project1\venv\Scripts\python.exe C:/Users/priya/PycharmProjects/project1/Python-Workshop-Fall2021/Demo.py
Other exception

Process finished with exit code 0

Question 94)



The screenshot shows the PyCharm IDE with a file named `Demo.py`. The code defines a function `remove_duplicate_items(lists)` that creates a new list, iterates through the input list, and appends items only if they are not already in the new list. Below the function, a list `list=[12,24,35,24,88,120,155,88,120,155]` is defined, and the function is called with `print(remove_duplicate_items(list))`. The Run window shows the command `C:\Users\priya\PycharmProjects\project1\venv\Scripts\python.exe C:/Users/priya/PycharmProjects/project1/Python-Workshop-Fall2021/Demo.py` and the output `[12, 24, 35, 88, 120, 155]`, which is the original list with duplicates removed.

```
1 def remove_duplicate_items(lists):
2     new_list=[]
3     seen = set()
4     for item in lists:
5         if item not in new_list:
6             new_list.append(item)
7     return new_list
8
9 list=[12,24,35,24,88,120,155,88,120,155]
10 print(remove_duplicate_items(list)) #prints the list after removing all duplicate values with original order reserved
```

Run: Demo x

C:\Users\priya\PycharmProjects\project1\venv\Scripts\python.exe C:/Users/priya/PycharmProjects/project1/Python-Workshop-Fall2021/Demo.py
[12, 24, 35, 88, 120, 155]

Process finished with exit code 0