

111B Data Science and Python Programming

Homework Assignment #1

Due: 2023/3/2 12:00:00

Time management is not an easy thing for everybody, especially for a young, passionate, wealthy, but extremely busy man like Ho Ho Cheng. After being tortured by many courses of NYCU in last semester, he accepted a friend's suggestion and decided to take a day off and go to a wonderful trip.

Problem #1: Master of Time Management

During this wonderful trip, he visits a city with full of passion. There are many enthusiastic citizens in this city, and each of them can bring him different degrees of joy. Obviously, he cannot go out with everybody at the same time. That will be... too dangerous for him. Also, in order to have a wonderful date with each citizen, he needs to prepare some special gifts to make them happy so that he can hang out with them. Fortunately, his lovely friend, although we have no idea that who she/he is, has already investigated everything he needs to know, as shown in the following table:

Name	Gift Price (\$)	Dating Time (hr)	Spirit Recharge (%)
Aaliyah	100	3	13
Bessy	50	2	5
Catherine	75	2.5	10
Esther	40	5	12
Hannah	80	4	15
Ivy	55	1	7
Lilith	125	3	15
Melody	35	1.5	6
Ruby	70	3.5	8
YingChih	200	8	30
Zoe	60	3	6

Since he only has limited time (24 hours) and cash (\$500), he needs your help to find the maximum joy during this trip. Please write a program that uses greedy algorithm to provide him a good dating schedule. For simplicity, let assume the definition of maximum joy is maximum spirit recharge.

Please accomplish this homework with an organized code (e.g., with main script and function script). Here is a template for your code structure:

```
111B_hw1_0123456789
├─ *.py          # *** of homework #1
├─ ????.py       # ??? of homework #1
├─ .....        # .....
└─ main_hw1.py   # Main script of homework #1
```

You don't need to follow this structure, just keep your main script clean.

If everything goes well, your code might get this result:

```
(nycudopcs) 0:\                               ,Homeworks\111B\HW1>py main_hw1.py
=====
Ho Ho Cheng starts this trip with $500.
=====
Spirit recharge of this trip is 79%.
  YingChih: <200, 8, 30>
  Hannah: <80, 4, 15>
  Lilith: <125, 3, 15>
  Esther: <40, 5, 12>
  Ivy: <55, 1, 7>
Remaining cash: $0.
Total dating time: 21.0.

(nycudopcs) 0:\                               ,Homeworks\111B\HW1>py main_hw1.py --cash 600
=====
Ho Ho Cheng starts this trip with $600.
=====
Spirit recharge of this trip is 92%.
  YingChih: <200, 8, 30>
  Hannah: <80, 4, 15>
  Lilith: <125, 3, 15>
  Aaliyah: <100, 3, 13>
  Esther: <40, 5, 12>
  Ivy: <55, 1, 7>
Remaining cash: $0.
Total dating time: 24.0.
```

TRIVIA

During our entire life,
we all have a chance to consider a philosophic question.
What is the maximum joy from Ho Ho Chen's point of view?

Hand in procedure:

As we had mentioned in the lecture, you should list all your collaborators in your programs (e.g., signature). **Your signature should be attached in your main script.** Here is the template of signature:

```
"""  
Created on Sun Aug 7 01:23:45 2022  
  
@author: Xi Winnie, student ID  
  
@collaborators: Jane Doe, her student ID  
                John Doe, his student ID  
"""
```

Please save your code as a “.zip”, “.7z”, or “.rar” file, where the file name should follow this format:

111B_hw1_**ID**.zip

For example,

111B_hw1_**0123456789**.zip

Please be aware. **We are not going to accept any homework file with wrong file name or without signature.** Please double check the content of your file.

Once you have accomplished your works, you can upload your homework to the “E3@NYCU” system. There will be a section for uploading your homework.