

**United International University (UIU)**

**Dept. of Computer Science & Engineering (CSE)**

Course Code: CSI 228 Section:

Course Title: Algorithms Lab

Maximize your silver coins

Suppose, you are working as an apprentice magician who makes potions. You work **6 hours a day** from 12:00 PM to 6 PM. You make **five** types of potions: their names, prices (in silver coins) and times to make them (in hour) is given bellow:

|  |  |  |
| --- | --- | --- |
| Potion | Time needed (hour) | Price (#silver-coins) |
| r | 2 | 2000 |
| s | 1 | 1000 |
| t | 1 | 4000 |
| u | 2 | 3000 |
| v | 1 | 3000 |

You receive orders from your classmates to make potions; each order provides you three information. **One**, the name of the classmate. **Two**, the name of the potion. **Three**, within which time you must make this potion (**last time**). If you fail to make the potion within that time, then you are not paid. You cannot make multiple potions at a time. **Write the following greedy algorithm to choose the orders to maximize your silver coins and cancel the others. Print the name of classmates you have chosen and the #silver coins you are going to earn tomorrow.**

[You do not need to work continuously to make a potion. For example, if you want you can make the potion **r,** which needs 2 hours to make, from 7PM-8PM then 9PM-10PM.]

1. Sort the orders by descending order of *#silver-coins per hour*.
2. Choose the order with the **highest** *#silver-coins per hour* and do it in the last possible hours. Make those hours occupied.
3. Choose the **next highest** paid (*#silver-coins per hour*) order, find the last possible hours that are not occupied, do it at those hours and make those hours occupied. If enough hour is not free to make this potion, you cancel this order.
4. Repeat step 3 until no order in left unscheduled.

|  |  |
| --- | --- |
| **Sample Input** | **Sample Output** |
| |  |  |  | | --- | --- | --- | | classmate | Potion name | Last time (PM) | | a | r | 4 | | b | s | 1 | | c | t | 1 | | d | u | 4 | | e | v | 3 | | c, e, d  10000  Explanation:  c:12PM ,4000sc  e:2PM ,3000sc  d:1PM,3PM,3000sc  b: not possible  a: not possible |
| |  |  |  | | --- | --- | --- | | classmate | Potion name | Last time (PM) | | a | r | 4 | | b | s | 5 | | c | t | 1 | | d | u | 3 | | c, d, b  8000  Explanation:  c:12PM ,4000sc  d:1PM,2PM,3000sc  b:4PM ,1000sc  a: not possible |