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[NPTEL \(https://swayam.gov.in/explorer?ncCode=NPTEL\)](https://swayam.gov.in/explorer?ncCode=NPTEL) » **Programming, Data Structures And Algorithms**
**Using Python (course)**

Announcements (announcements)

**About the Course** ([https://swayam.gov.in/nd1\\_noc19\\_cs40/preview](https://swayam.gov.in/nd1_noc19_cs40/preview)) Ask a Question (forum)

Progress (student/home) Mentor (student/mentor)

## Week 5 Programming Assignment

**Due on 2019-09-06, 23:59 IST**

For this assignment, you have to write a complete Python program. Paste your code in the window below.

- You may define additional auxiliary functions as needed.
- There are some public test cases and some (hidden) private test cases.
- "Compile and run" will evaluate your submission against the public test cases
- "Submit" will evaluate your submission against the hidden private test cases. There are 6 private test cases, with equal weightage. You will get feedback about which private test cases pass or fail, though you cannot see the actual test cases.
- Ignore warnings about "Presentation errors".

Here are some basic facts about tennis scoring: A tennis match is made up of sets. A set is made up of games.

To win a set, a player has to win 6 games with a difference of 2 games. At 6-6, there is often a special tie-breaker. In some cases, players go on playing till one of them wins the set with a difference of two games.

Tennis matches can be either 3 sets or 5 sets. The player who wins a majority of sets wins the match (i.e., 2 out of 3 sets or 3 out of 5 sets) The score of a match lists out the games in each set, with the overall winner's score reported first for each set. Thus, if the score is 6-3, 5-7, 7-6 it means that the first player won the first set by 6 games to 3, lost the second one 5 games to 7 and won the third one 7 games to 6 (and hence won the overall match as well by 2 sets to 1).

You will read input from the keyboard (standard input) containing the results of several tennis matches. Each match's score is recorded on a separate line with

 Course  
outline

 How to access  
the portal

 Week 1:  
Introduction

Week 1 Quiz

 Week 2: Basics  
of Python

Week 2 Quiz

 Week 2  
Programming  
Assignment

 Week 3: Lists,  
inductive  
function  
definitions,  
sorting

 Week 3  
Programming  
Assignment

**Week 4: Sorting, Tuples, Dictionaries, Passing Functions, List Comprehension**

**Week 4 Quiz**

**Week 4 Programming Assignment**

**Week 5: Exception handling, input/output, file handling, string processing**

**Week 5 Programming Assignment**

**Week 5 Programming Assignment (noc19\_cs40/progassignment?name=95)**

**Week 6: Backtracking, scope, data structures; stacks, queues and heaps**

**Week 6 Quiz**

**Week 7: Classes, objects and user defined datatypes**

**Week 7 Quiz**

**Week 8: Dynamic programming, wrap-up**

**Week 8 Programming Assignment**

the following format:

Winner:Loser:Set -1- score , . . . , Set -k- score, where  $2 \leq k \leq 5$

For example, an input line of the form

```
Halep:Wozniacki:3-6,6-3,6-3
```

indicates that Halep beat Wozniacki 3-6, 6-3, 6-3 in a best of 3 set match.

The input is terminated by a blank line.

You have to write a Python program that reads information about all the matches and compile the following statistics for each player:

1. Number of best-of-5 set matches won
2. Number of best-of-3 set matches won
3. Number of sets won
4. Number of games won
5. Number of sets lost
6. Number of games lost

You should print out to the screen (standard output) a summary in decreasing order of ranking, where the ranking is according to the criteria 1-6 in that order (compare item 1, if equal compare item 2, if equal compare item 3 etc, noting that for items 5 and 6 the comparison is reversed).

For instance, given the following data

```
Federer:Nadal:2-6,6-7,7-6,6-3,6-1
Nadal:Federer:6-3,4-6,6-4,6-3
Federer:Nadal:6-0,7-6,6-7,6-3
Nadal:Federer:6-4,6-4
Federer:Nadal:2-6,6-2,6-0
Nadal:Federer:6-3,4-6,6-3,6-4
Federer:Nadal:7-6,4-6,7-6,2-6,6-2
Nadal:Federer:7-5,7-5
Halep:Wozniacki:3-6,6-3,6-3
```

your program should print out the following

```
Federer 3 1 13 142 16 143
Nadal 2 2 16 143 13 142
Halep 0 1 2 15 1 12
Wozniacki 0 0 1 12 2 15
```

You can assume that there are no spaces around the punctuation marks ":", "-", and ",". Each player's name will be spelled consistently and no two players have the same name.

### Sample Test Cases

**Input**

**Output**

**Download  
videos**

**Text Transcripts**

**Online  
Programming  
Test - Sample**

**Online  
Programming  
Test 1, 26 Sep  
2019, 09:30-  
11:30**

**Online  
Programming  
Test 2, 26 Sep  
2019, 20:00-  
22:00**

**Test  
Case 1**

```
Federer:Djokovic:2-6,6-7,7-6,6-3,6-1
Djokovic:Federer:6-3,4-6,6-4,6-3
Federer:Djokovic:6-0,7-6,6-7,6-3
Djokovic:Federer:6-4,6-4
Federer:Djokovic:2-6,6-2,6-0
Djokovic:Federer:6-3,4-6,6-3,6-4
Federer:Djokovic:7-6,4-6,7-6,2-6,6-2
Djokovic:Federer:7-5,7-5
Halep:Barty:3-6,6-3,6-3
```

```
Federer 3 1 13 142
16 143
Djokovic 2 2 16 143
13 142
Halep 0 1 2 15 1 12
Barty 0 0 1 12 2 15
```

**Test  
Case 2**

```
Halep:Medvedev:2-6,6-7,7-6,6-3,6-1
Williams:Medvedev:6-3,4-6,6-4,6-3
Medvedev:Thiem:6-0,7-6,6-7,6-3
Thiem:Medvedev:6-4,6-4
Halep:Medvedev:2-6,6-2,6-0
Thiem:Medvedev:6-3,4-6,6-3,6-4
Medvedev:Thiem:7-6,4-6,7-6,2-6,6-2
Thiem:Williams:7-5,7-5
Halep:Williams:3-6,6-3,6-3
Halep:Thiem:0-6,0-6,6-0,6-0,7-5
Williams:Thiem:6-3,4-6,7-6,0-6,7-5
```

```
Halep 2 2 10 75 6 6
0
Medvedev 2 0 11 122
16 139
Williams 2 0 7 68 7
71
Thiem 1 2 14 133 13
128
```

**Test  
Case 3**

```

Djokovic:Zverev:2-6, 6-7, 7-
6, 6-3, 6-1
Zverev:Djokovic:6-3, 4-6, 6-
4, 6-3
Djokovic:Zverev:6-0, 7-6, 6-
7, 6-3
Zverev:Djokovic:6-4, 6-4
Djokovic:Zverev:2-6, 6-2, 6-0
Zverev:Djokovic:6-3, 4-6, 6-
3, 6-4
Djokovic:Zverev:7-6, 4-6, 7-
6, 2-6, 6-2
Zverev:Djokovic:7-5, 7-5
Williams:Muguruza:3-6, 6-3, 6
-3
Muguruza:Williams:6-4, 6-4
Williams:Muguruza:2-6, 6-2, 6
-0
Muguruza:Williams:6-3, 4-6, 6
-4, 6-3
Williams:Muguruza:6-0, 7-6, 6
-7, 6-3
Muguruza:Williams:6-3, 4-6, 6
-4, 6-3
Williams:Muguruza:6-0, 7-6, 6
-7, 6-3
Muguruza:Williams:6-3, 4-6, 6
-4, 6-3
Williams:Muguruza:6-0, 7-6, 6
-7, 6-3

```

```

Williams 3 2 16 160
16 146
Muguruza 3 1 16 146
16 160
Djokovic 3 1 13 142
16 143
Zverev 2 2 16 143 1
3 142

```

Test  
Case 4

```
Halep:Medvedev:2-6,6-7,7-6,
6-3,6-1
Barty:Medvedev:6-3,4-6,6-4,
6-3
Medvedev:Thiem:6-0,7-6,6-7,
6-3
Thiem:Medvedev:6-4,6-4
Halep:Medvedev:2-6,6-2,6-0
Thiem:Medvedev:6-3,4-6,6-3,
6-4
Medvedev:Thiem:7-6,4-6,7-6,
2-6,6-2
Thiem:Barty:7-5,7-5
Halep:Barty:3-6,6-3,6-3
Halep:Thiem:0-6,0-6,6-0,6-
0,7-5
Barty:Thiem:6-3,4-6,7-6,0-
6,7-5
Halep:Medvedev:2-6,6-7,7-6,
6-3,6-1
Barty:Medvedev:6-3,4-6,6-4,
6-3
Medvedev:Thiem:6-0,7-6,6-7,
6-3
Thiem:Medvedev:6-4,6-4
Halep:Medvedev:2-6,6-2,6-0
Thiem:Medvedev:6-3,4-6,6-3,
6-4
Medvedev:Thiem:7-6,4-6,7-6,
2-6,6-2
Thiem:Barty:7-5,7-5
Halep:Barty:3-6,6-3,6-3
Halep:Thiem:0-6,0-6,6-0,6-
0,7-5
Barty:Thiem:6-3,4-6,7-6,0-
6,7-5
```

```
Halep 4 4 20 150 12
120
Medvedev 4 0 22 244
32 278
Barty 4 0 14 136 14
142
Thiem 2 4 28 266 26
256
```

Test  
Case 5

```
Djokovic:Zverev:2-6,6-7,7-
6,6-3,6-1
Zverev:Djokovic:6-3,4-6,6-
4,6-3
Djokovic:Zverev:6-0,7-6,6-
7,6-3
Zverev:Djokovic:6-4,6-4
Djokovic:Zverev:2-6,6-2,6-0
Zverev:Djokovic:6-3,4-6,6-
3,6-4
Djokovic:Zverev:7-6,4-6,7-
6,2-6,6-2
Zverev:Djokovic:7-5,7-5
Williams:Muguruza:3-6,6-3,6
-3
```

```
Halep 4 4 20 150 12
120
Medvedev 4 0 22 244
32 278
Kerber 4 0 14 136 1
4 142
Williams 3 2 16 160
16 146
Muguruza 3 1 16 146
16 160
Djokovic 3 1 13 142
16 143
Thiem 2 4 28 266 26
256
```

```

Muguruza:Williams:6-4,6-4
Williams:Muguruza:2-6,6-2,6-0
Muguruza:Williams:6-3,4-6,6-4,6-3
Williams:Muguruza:6-0,7-6,6-7,6-3
Muguruza:Williams:6-3,4-6,6-4,6-3
Williams:Muguruza:6-0,7-6,6-7,6-3
Muguruza:Williams:6-3,4-6,6-4,6-3
Williams:Muguruza:6-0,7-6,6-7,6-3
Halep:Medvedev:2-6,6-7,7-6,6-3,6-1
Kerber:Medvedev:6-3,4-6,6-4,6-3
Medvedev:Thiem:6-0,7-6,6-7,6-3
Thiem:Medvedev:6-4,6-4
Halep:Medvedev:2-6,6-2,6-0
Thiem:Medvedev:6-3,4-6,6-3,6-4
Medvedev:Thiem:7-6,4-6,7-6,2-6,6-2
Thiem:Kerber:7-5,7-5
Halep:Kerber:3-6,6-3,6-3
Halep:Thiem:0-6,0-6,6-0,6-0,7-5
Kerber:Thiem:6-3,4-6,7-6,0-6,7-5
Halep:Medvedev:2-6,6-7,7-6,6-3,6-1
Kerber:Medvedev:6-3,4-6,6-4,6-3
Medvedev:Thiem:6-0,7-6,6-7,6-3
Thiem:Medvedev:6-4,6-4
Halep:Medvedev:2-6,6-2,6-0
Thiem:Medvedev:6-3,4-6,6-3,6-4
Medvedev:Thiem:7-6,4-6,7-6,2-6,6-2
Thiem:Kerber:7-5,7-5
Halep:Kerber:3-6,6-3,6-3
Halep:Thiem:0-6,0-6,6-0,6-0,7-5
Kerber:Thiem:6-3,4-6,7-6,0-6,7-5

```

```

Zverev 2 2 16 143 1
3 142

```

Test

## Case 6

```

Djokovic:Zverev:2-6,6-7,7-6,6-3,6-1
Zverev:Djokovic:6-3,4-6,6-4,6-3
Djokovic:Zverev:6-0,7-6,6-7,6-3
Zverev:Djokovic:6-4,6-4
Djokovic:Zverev:2-6,6-2,6-0
Zverev:Djokovic:6-3,4-6,6-3,6-4
Djokovic:Zverev:7-6,4-6,7-6,2-6,6-2
Zverev:Djokovic:7-5,7-5
Williams:Muguruza:3-6,6-3,6-3
Muguruza:Williams:6-4,6-4
Williams:Muguruza:2-6,6-2,6-0
Muguruza:Williams:6-3,4-6,6-4,6-3
Williams:Muguruza:6-0,7-6,6-7,6-3
Muguruza:Williams:6-3,4-6,6-4,6-3
Williams:Muguruza:6-0,7-6,6-7,6-3
Muguruza:Williams:6-3,4-6,6-4,6-3
Williams:Muguruza:6-0,7-6,6-7,6-3
Halep:Medvedev:2-6,6-7,7-6,6-3,6-1
Barty:Medvedev:6-3,4-6,6-4,6-3
Medvedev:Thiem:6-0,7-6,6-7,6-3
Thiem:Medvedev:6-4,6-4
Halep:Medvedev:2-6,6-2,6-0
Thiem:Medvedev:6-3,4-6,6-3,6-4
Medvedev:Thiem:7-6,4-6,7-6,2-6,6-2
Thiem:Barty:7-5,7-5
Halep:Barty:3-6,6-3,6-3
Halep:Thiem:0-6,0-6,6-0,6-0,7-5
Barty:Thiem:6-3,4-6,7-6,0-6,7-5
Halep:Medvedev:2-6,6-7,7-6,6-3,6-1
Barty:Medvedev:6-3,4-6,6-4,6-3
Medvedev:Thiem:6-0,7-6,6-7,
Halep 8 8 40 300 24
240
Medvedev 8 0 44 488
64 556
Barty 8 0 28 272 28
284
Williams 6 4 32 320
32 292
Muguruza 6 2 32 292
32 320
Djokovic 6 2 26 284
32 286
Thiem 4 8 56 532 52
512
Zverev 4 4 32 286 2
6 284

```

```
6-3
Thiem:Medvedev:6-4,6-4
Halep:Medvedev:2-6,6-2,6-0
Thiem:Medvedev:6-3,4-6,6-3,
6-4
Medvedev:Thiem:7-6,4-6,7-6,
2-6,6-2
Thiem:Barty:7-5,7-5
Halep:Barty:3-6,6-3,6-3
Halep:Thiem:0-6,0-6,6-0,6-
0,7-5
Barty:Thiem:6-3,4-6,7-6,0-
6,7-5
Djokovic:Zverev:2-6,6-7,7-
6,6-3,6-1
Zverev:Djokovic:6-3,4-6,6-
4,6-3
Djokovic:Zverev:6-0,7-6,6-
7,6-3
Zverev:Djokovic:6-4,6-4
Djokovic:Zverev:2-6,6-2,6-0
Zverev:Djokovic:6-3,4-6,6-
3,6-4
Djokovic:Zverev:7-6,4-6,7-
6,2-6,6-2
Zverev:Djokovic:7-5,7-5
Williams:Muguruza:3-6,6-3,6
-3
Muguruza:Williams:6-4,6-4
Williams:Muguruza:2-6,6-2,6
-0
Muguruza:Williams:6-3,4-6,6
-4,6-3
Williams:Muguruza:6-0,7-6,6
-7,6-3
Muguruza:Williams:6-3,4-6,6
-4,6-3
Williams:Muguruza:6-0,7-6,6
-7,6-3
Muguruza:Williams:6-3,4-6,6
-4,6-3
Williams:Muguruza:6-0,7-6,6
-7,6-3
Halep:Medvedev:2-6,6-7,7-6,
6-3,6-1
Barty:Medvedev:6-3,4-6,6-4,
6-3
Medvedev:Thiem:6-0,7-6,6-7,
6-3
Thiem:Medvedev:6-4,6-4
Halep:Medvedev:2-6,6-2,6-0
Thiem:Medvedev:6-3,4-6,6-3,
6-4
```



```

Medvedev:Thiem:7-6,4-6,7-6,
2-6,6-2
Thiem:Barty:7-5,7-5
Halep:Barty:3-6,6-3,6-3
Halep:Thiem:0-6,0-6,6-0,6-
0,7-5
Barty:Thiem:6-3,4-6,7-6,0-
6,7-5
Halep:Medvedev:2-6,6-7,7-6,
6-3,6-1
Barty:Medvedev:6-3,4-6,6-4,
6-3
Medvedev:Thiem:6-0,7-6,6-7,
6-3
Thiem:Medvedev:6-4,6-4
Halep:Medvedev:2-6,6-2,6-0
Thiem:Medvedev:6-3,4-6,6-3,
6-4
Medvedev:Thiem:7-6,4-6,7-6,
2-6,6-2
Thiem:Barty:7-5,7-5
Halep:Barty:3-6,6-3,6-3
Halep:Thiem:0-6,0-6,6-0,6-
0,7-5
Barty:Thiem:6-3,4-6,7-6,0-
6,7-5

```

**Test  
Case 7**

```

Federer:Djokovic:2-6,6-7,7-
6,6-3,6-1
Djokovic:Federer:6-3,4-6,6-
4,6-3
Federer:Djokovic:6-0,7-6,6-
7,6-3
Djokovic:Federer:6-4,6-4
Federer:Djokovic:2-6,6-2,6-
0
Djokovic:Federer:6-3,4-6,6-
3,6-4
Federer:Djokovic:7-6,4-6,7-
6,2-6,6-2
Djokovic:Federer:7-5,7-5
Halep:Barty:3-6,6-3,6-3

```

```

Federer 3 1 13 142
16 143
Djokovic 2 2 16 143
13 142
Halep 0 1 2 15 1 12
Barty 0 0 1 12 2 15

```

Test  
Case 8

```
Halep:Medvedev:2-6,6-7,7-6,
6-3,6-1
Williams:Medvedev:6-3,4-6,6
-4,6-3
Medvedev:Thiem:6-0,7-6,6-7,
6-3
Thiem:Medvedev:6-4,6-4
Halep:Medvedev:2-6,6-2,6-0
Thiem:Medvedev:6-3,4-6,6-3,
6-4
Medvedev:Thiem:7-6,4-6,7-6,
2-6,6-2
Thiem:Williams:7-5,7-5
Halep:Williams:3-6,6-3,6-3
Halep:Thiem:0-6,0-6,6-0,6-
0,7-5
Williams:Thiem:6-3,4-6,7-6,
0-6,7-5
```

```
Halep 2 2 10 75 6 6
0
Medvedev 2 0 11 122
16 139
Williams 2 0 7 68 7
71
Thiem 1 2 14 133 13
128
```

Test  
Case 9

```
Djokovic:Zverev:2-6,6-7,7-
6,6-3,6-1
Zverev:Djokovic:6-3,4-6,6-
4,6-3
Djokovic:Zverev:6-0,7-6,6-
7,6-3
Zverev:Djokovic:6-4,6-4
Djokovic:Zverev:2-6,6-2,6-0
Zverev:Djokovic:6-3,4-6,6-
3,6-4
Djokovic:Zverev:7-6,4-6,7-
6,2-6,6-2
Zverev:Djokovic:7-5,7-5
Williams:Muguruza:3-6,6-3,6
-3
Muguruza:Williams:6-4,6-4
Williams:Muguruza:2-6,6-2,6
-0
Muguruza:Williams:6-3,4-6,6
-4,6-3
Williams:Muguruza:6-0,7-6,6
-7,6-3
Muguruza:Williams:6-3,4-6,6
-4,6-3
Williams:Muguruza:6-0,7-6,6
-7,6-3
Muguruza:Williams:6-3,4-6,6
-4,6-3
Williams:Muguruza:6-0,7-6,6
-7,6-3
```

```
Williams 3 2 16 160
16 146
Muguruza 3 1 16 146
16 160
Djokovic 3 1 13 142
16 143
Zverev 2 2 16 143 1
3 142
```

The due date for submitting this assignment has passed.

As per our records you have not submitted this assignment.

Sample solutions (Provided by instructor)

```

1 # Statistics will be stored as a dictionary
2 # Each key is a player name, each value is a list of 6 integers
3 # representing
4 #   Best of 5 set matches won,
5 #   Best of 3 set matches won,
6 #   Sets won
7 #   Games won
8 #   Sets lost (store as negative number for comparison)
9 #   Games lost (store as negative number for comparison)
10 stats = {}
11
12 # Read a line of input
13 line = input()
14 while line:
15     # Keep track of sets/games won and lost in this match
16     # with respect to winner of the match
17     (wsets,lsets,wgames,lgames) = (0,0,0,0)
18
19     # Extract winner, loser and string of setscores
20     (winner,loser,setscores) = line.strip().split(':',2)
21
22     # Extract sequence of sets from setscores
23     sets = setscores.split(',')
24
25     for set in sets:
26         # Process each set
27         (winstr,losestr) = set.split('-')
28         win = int(winstr)
29         lose = int(losestr)
30         wgames = wgames + win
31         lgames = lgames + lose
32         if win > lose:
33             wsets = wsets + 1
34         else:
35             lsets = lsets + 1
36
37     # Update statistics for each of the players
38
39     for player in [winner,loser]:
40         try:
41             stats[player]
42         except KeyError:
43             stats[player] = [0,0,0,0,0,0]
44
45     if wsets >= 3:
46         stats[winner][0] = stats[winner][0] + 1
47     else:
48         stats[winner][1] = stats[winner][1] + 1
49
50     stats[winner][2] = stats[winner][2] + wsets
51     stats[winner][3] = stats[winner][3] + wgames
52     stats[winner][4] = stats[winner][4] - lsets
53     stats[winner][5] = stats[winner][5] - lgames
54
55     stats[loser][2] = stats[loser][2] + lsets
56     stats[loser][3] = stats[loser][3] + lgames
57     stats[loser][4] = stats[loser][4] - wsets
58     stats[loser][5] = stats[loser][5] - wgames
59
60     line = input()
61
62 # Collect each player's stats as a tuple, name last
63 statlist = [(stat[0],stat[1],stat[2],stat[3],stat[4],stat[5],name) for
64             name,stat in stats.items()]
65 # Sort the statistics in descending order
66 # Losing games are stored negatively for sorting correctly
67 statlist.sort(reverse = True)
68
69 # Print
70 for entry in statlist:
71     print(entry[6],entry[0],entry[1],entry[2],entry[3], -entry[4], -ent
72
73

```

