Exercises

Exercise 1: Write a Python program able to handle the scores of an artistic gymnastic event. The event scores are provided by the user one by one. For any participant, the user introduces one by one the competitor's name and surname, competitor's gender, nationality, and the assigned evaluations provided by 5 judges. For example, the first seven participants are listed below:

```
Yuri Chechi M ITA 9.3 8.9 9.7 9.7 9.8
Veronica Servente F ITA 9.0 9.0 9.0 9.2 9.5
Sabrina Vega F USA 8.4 8.7 8.5 8.6 9.0
Viktoria Komova F RUS 8.3 8.7 9.5 9.6 9.0
Rebecca Downie F GRB 8.2 8.9 8.9 8.6 9.3
Gabbie Douglas F USA 8.2 8.9 8.9 8.6 9.3
Hannah Whelan F GRB 8.0 8.0 8.0 8.0 8.0
```

Assumptions:

- The total number of competitors is not known
- The competitor's name and surname do not contain spaces
- Competitor's gender is only one character M or F
- Competitor's nationality is written in 3 uppercase letters
- There are always 5 evaluations for every competitor; the evaluation of every judge is a real number (only 1 decimal digit) from 0.0 to 10.0.

The program should show:

1. The name of the competitor with the highest score by a judge along with that score.

2. Name of countries participating in the event.

3. The best female competitor: consider that for computing the final records, the highest and lowest evaluations are ignored and the score is determined by the sum of the remaining 3 values.

4. The final ranking for the best 3 countries: considering for every country the sum of all the competitors (M and F) of this country, always ignoring for every competitor the highest and lower evaluations.

Exercise 2: (PAST EXAM 2020)

The PoliTo company wants to create an application capable of tracking the sales of its products in order to identify any counterfeits. The application must analyze the contents of two files. A list "products" is created by the parent company and contains, for each product manufactured, the identifier of the unique one official dealer who is authorized to sell the product. There are two for each line in the file information (strings separated by a space):

product_id reseller_id

Each product and each seller are identified by a unique alphanumeric code.

A second list "purchases", contains information on sales that have been recorded by buyers. The file contains on each line the code of the product purchased and the retailer who managed the delivery.

Since a product can only be sold by the official dealer authorized by the parent company, any purchase of that product by a buyer through a not official retailer must be reported as a suspicion to then allow the parent company to carry out the necessary checks.

The parent company therefore asks you to write a Python program which, prints the list of possible suspicious sales. Specifically, for each product sold by one or more non-resellers authorized, the program must print the product code on output (in the format indicated in the example below) in question, the official reseller and the list of all resellers with which customers have registered the sale.

*** Note ***: there is no sorting of the two input files

Example products.txt:

```
P234HF22222 r1011
P234HF22223 r1112
P234HF22225 r1114
P111TG11115 r1015
P111TG11116 r1216
P331LS00110 r1017
P331LS00120 r1318
P331LS00130 r1019
```

Example purchases.txt

```
P234HF22223 r1112
P111TG11115 r1015
P111TG11115 r1216
P234HF22222 r1011
P331LS00110 r1014
P331LS00120 r1318
P331LS00130 r1019
P234HF22225 r1114
P234HF22223 r1114
```

Program output

```
Suspicious transactions list
Product code: P234HF22223
Official dealer: r1112
Dealer list: r1114

Product code: P111TG11115
Official dealer: r1015
Dealer list: r1216

Product code: P331LS00110
Official dealer: r1017
Dealer list: r1014
```

Tutorial

Did you know?

Best way to remove duplicates is → `list(dict.fromkeys(my_list))`

(All codes are provided separately in filters_and_maps.py)

1- Filters in python:

The filter() function extracts elements from an iterable (list, tuple etc.) for which a function returns True.

Its syntax is:

filter(function, iterable)

The filter() function returns an iterator.

Example: Write a program that takes a list and prints the even numbers in this list.

2- Lambdas:

Lambdas are built in functions in python that let you small functions to be applied to each object in the iterator.

3- Map:

map() function returns a map object(which is an iterator) of the results after applying the given function to each item of a given iterable (list, tuple etc.)

Syntax :

map(fun, iter)
Parameters :

fun : It is a function to which map passes each element of given iterable.
iter : It is a iterable which is to be mapped.

NOTE : You can pass one or more iterable to the map() function.

Returns :

Returns a list of the results after applying the given function to each item of a given iterable (list, tuple etc.)

Example: write a program that multplies each element in the list by itself.

Example2:
Given world_cup=[

```
["Italy",4],
["France",2],
["Brazil",6],        #This line is not wrong
["Argentina",2],
["Uruguay",2],
["Germany",4],
["England",1],
["Spain",1] ]
```

Print a list of the first three capital letters of each country with more than 3 world cups.