
Gene expression measurements

T35289_en

We have done some experiments measuring the expression of several genes in a population subjected to a genetic therapy. For each gene, we have the measurement of its expression in the control population, and in the treated population. Write a program that computes the change recorded for each gene between both populations, and reports whether the gene is upregulated (positive change), downregulated (negative change), or presents no change. Finally, the program should report which gene suffered the largest change (either positive or negative). In case of a tie, report the first such gene found in the input.

Input

The input is a sequence of triplets. Each triplet consists of a string (gene name) and two real numbers: the expression in the control population and the expression in the treated population.

Output

The output is the value of the change in expression for each gene, and whether it is up- or down-regulated. At the end, the gene with largest change is reported. Follow the format of the examples.

Sample input 1

```
BRCA1 12.0 10.5
TP53 8.5 14.0
EGFR 3.2 2.8
MYC 15.1 20.4
VEGFA 6.0 3.1
```

Sample output 1

```
BRCA1 changed by -1.50. downregulated
TP53 changed by 5.50. upregulated
EGFR changed by -0.40. downregulated
MYC changed by 5.30. upregulated
VEGFA changed by -2.90. downregulated
The gene with the largest change is TP53.
```

Sample input 2

```
IL6 20.0 12.5
TNF 15.2 10.1
CXCL8 8.0 6.8
STAT3 11.5 5.0
JUN 6.2 6.2
SOX2 3.0 8.5
NANOG 4.1 9.0
POU5F1 5.5 12.3
KLF4 2.8 5.4
LIN28A 1.2 6.9
HBB 6.0 6.0
ALB 12.5 12.1
INS 3.3 3.9
APOE 7.7 7.0
FTO 5.5 5.6
```

Sample output 2

```
IL6 changed by -7.50. downregulated
TNF changed by -5.10. downregulated
CXCL8 changed by -1.20. downregulated
STAT3 changed by -6.50. downregulated
JUN changed by 0.00. no change
SOX2 changed by 5.50. upregulated
NANOG changed by 4.90. upregulated
POU5F1 changed by 6.80. upregulated
KLF4 changed by 2.60. upregulated
LIN28A changed by 5.70. upregulated
HBB changed by 0.00. no change
ALB changed by -0.40. downregulated
INS changed by 0.60. upregulated
APOE changed by -0.70. downregulated
FTO changed by 0.10. upregulated
The gene with the largest change is IL6.
```

Observation

Remember that to print a real number x with two decimal digits, you can use `f"x: .2f"`

Problem information

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