Exercise paper#6

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1 Exercise 1

The famous public transport corporation Trentino Trasporti is studying its data about train delays. In particular it is estimated that it takes 7200 seconds to travel from Mezzana to Trento. The technicians has measured train time arrivals during the year.
Write a function which takes an array of doubles as input. Each position of the array contains the time (in seconds) which has been spent by the train to travel from Mezzana to Trento. The function has to return how many times the train arrived late with respect to the predicted time (7200 seconds).

Example

Here is the array which contains the times to travel from Mezzana to Trento which have been measured:

7300.54 - 7190.89 - 7185.34 - 7201.2 - 7205.2

In this case the function has to return 3 because the train arrived late three times according to the data (7300.54, 7201.2, 7205.2).

2 Exercise 2

In order to be prepared for the incomining Easter period, a chocolate factory has decided to prepare 10 kinds of chocolate eggs (E1, E2, E3, E4, E5,..., E10) this year.
Each egg is composed by three main ingredients identified by letters A, B, C.
Each kind of chocolate egg is characterized by a different percentage of a given ingredient. For example E2 is composed by 30.2% of ingredient A, 30.60% of ingredient B and 31.0% of ingredient C.

Let M be a 10×3 matrix such that:

- each row of the matrix is an egg;
- first column is the amount of ingredient A;
- second column is the amount of ingredient B;
- third column is the amount of ingredient C;

Example

	A	B	C
E1	43.5	3.40	2.54
E2	23.5	3.32	2.54
E3	33.5	0.46	6.0
E4	9.4	4.43	23.6
E5	43.5	3.40	2.54

...

...

E6	2.55	2.56	2.54
E7	43.5	3.33	2.11
E8	76.5	3.34	24.5
E9	4.11	0.00	3.33
E10	4.11	0.00	3.33

Your purpose is to write a C++ program such that, given the matrix M, it prints the most used ingredient for each egg.

In the given example the output is:

- the most used ingredient in node **E1** is **A**
- the most used ingredient in node **E2** is **A**
- the most used ingredient in node **E3** is **A**
- the most used ingredient in node **E4** is **C**
- the most used ingredient in node **E5** is **A**
- the most used ingredient in node **E6** is **B**
- the most used ingredient in node **E7** is **A**
- the most used ingredient in node **E8** is **A**
- the most used ingredient in node **E9** is **A**
- the most used ingredient in node **E10** is **A**

3 Exercise 3

Michele is tiding up his school case. He typically uses a lot of pens of different colours.
He sent you the amount of pen of each colour which is contained in its school case. At this point, his dream is to discover the total number of pens he owns.
Write a function *sommatoria* which has two input arguments:

- an array of integers *colour* such that colour[i] indicates how many pens having colour *i* there are in Michele's case
- an integer N which indicates the number of possible colour (ie. the length of the array *colour*)

Example:

colour={5, 3, 5, 3, 1, 1};
N = 6;
cout«"Total number of pens: "«**sommatoria(colour, N)**«endl;

OUTPUT: 18