

## Rate of return

The rate of return  $r$  of a single financial asset over a period is the interest obtained at the end of period by investing on it.

### Example

If the rate of return over a single period is  $r = 0.05$  and we invest a quantity  $S = 1000$  euro at the beginning of the period, the final value of our portfolio is  $V = (1 + r)S = 1050$  euro at the end of the period.

### Requirements

Let us assume that, at the beginning of the period, we invest a total sum  $S$  over  $n$  assets with rate of return  $r_i$ , by allocating a fraction  $w_i$  of  $S$  in the  $i$ -th asset.

Write a program which reads the data from a file of name **data.csv** of the following format:

```
S;1000
n;8
w;r                                sum(1+ri)Swi
0.05;0.1
0.2;0.01
0.12;0.05
0.18;0.02
0.15;0.02
0.15;0.05
0.1;0.01
0.05;0.03
```

and computes the rate of return and the final value of the whole portfolio by exploiting C-Style arrays.

The read data and the result must be printed on the screen and on a file named “result.txt”.

The export format is:

```
S = 1000.00, n = 8
w = [ 0.05 0.2 0.12 0.18 0.15 0.15 0.1 0.05 ]
r = [ 0.1 0.01 0.05 0.02 0.02 0.05 0.01 0.03 ]
Rate of return of the portfolio: 0.0296
V: 1029.60
```

Remark:  $S$  and  $V$  must be printed in decimal notation with 2 digits of precision by keeping *trailing* zeros.