

## VG101 — Introduction to Computer and Programming

### Assignment 3

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- MATLAB: write each exercise in a different file
- C/C++: use the provided assignment template
- Include simple comments in the code
- If applicable, split the code over several functions
- Extensively test your code and improve it
- Write a single README file per assignment
- Zip all the files and upload the archive on Canvas

#### Ex. 1 — Accurate calculations

When an ancient Indian Brahmin invented the game of Chess he showed it to his king who was really impressed. He was so pleased that he allowed him to choose his own reward. The inventor replied that he wanted one grain of wheat on the first square of the chess board, two on the second, four on the third, eight on the fourth, and so forth. . . It took more than a week to the treasurer to calculate the amount of wheat required. Write a MATLAB script to help him determine how many grains of wheat had to be exactly given to the creator of Chess. The story ends with the creator of Chess becoming the new king.

#### Ex. 2 — Structures

The following table summarizes a wardrobe inventory. Create an appropriate MATLAB structure to represent the data, and write a script to determine (i) which item (Type+Color) is in the largest quantity and (ii) how old are the items in average – age in years, rounded down.

Type	Color	Quantity	Bought
Jumpers	Blue	2	04/2005
	Brown	3	02/2013
	Green	5	01/2015
Trousers	Black	3	06/2012
	Grey	2	04/2011
	White	1	12/2013
T-shirts	Blue	1	05/2010
	Green	2	09/2014
	Red	3	01/2012
	White	2	03/2008
	Yellow	1	11/2012

#### Ex. 3 — Input and output

Write a MATLAB function which takes as input an integer  $n$  and dumps in a file all the multiples  $n \times i$ ,  $0 \leq i \leq 10$ . Respect the following format (do not output the dots, and the line numbers):

```
1 23 x 0 = 0
2 23 x 1 = 23
3 23 x 2 = 46
4 . . .
```

#### Ex. 4 — Plotting

Plot a simple house and a car using basic geometric shapes such as rectangles, trapeziums, circles, and triangles.