**CLASS WORK IAX 0583 27.11.2024** 4p+(2p for functions code)

The goal of today’s assignment is to create **the main** and **prototypes** of a program. All the code in the assignment will be written without the help of AI or any chatbot, as the main aim is to improve the students understanding of programming fundamentals. The code should be written whilst following the principle of separating the programs input, processing and output.

As stated, the main goal is to create **the main** function and function **prototypes** for a selected program. This means that inside the main function you will write out any function calls and variable declarations. **The main** should **ONLY** contain function calls and variable declarations. Similarly, function calls and variable declarations should **NOT** be written **outside the main**.

The choice of names for these functions and variables are left up to the student, but should relate to how a function or variable is used (ex. function “userInput” for getting input from a user or variable “i” for iteration.). When naming functions students should follow a naming convention of either Camelcase (functionName) or Snake case (function\_name). Pick one to use and do **NOT** mix the two. The point is to increase readability and a consistent function naming convention makes it much easier to understand code.

When you create function calls in the main you will have to create a matching **prototype** for each call. **Prototypes** are written out above the main function but below any library includes. When creating function calls and prototypes it’s good to keep in mind the kind of information you would want from a function and the type of information you would need to give a function. This helps when choosing the data types for each function prototype and its parameters. **FOR EXAMPLE**: int readSingleInput(char[]) means that I want to get an int value from the function using return and I am passing the function a char array, containing a possible message for the user, to the print out to the user.

At the minimum, when creating function prototypes there have to be at least prototypes for the input, processing and output. **NB!** This does not mean that the prototypes have to be named input, processing and output, but that the three main parts of the program are represented in the function calls and prototypes. This also means that three main function prototypes can consist of multiple function prototypes (ex. readInputInt and readInputFloat are separate function prototypes, but represent the input as a whole).

Use of materials from the previous weeks as well as any programs you’ve previously created is permitted and even encouraged.

To help give a better understanding of how the assignment can be approached, several keywords have been highlighted.

The keywords highlighted bright red are related to data types and variables. Understanding these variables and data types as well as how to use them will come in handy when creating your program code.

**Assignment variations:**

The main goal of your program will be specified below. Choose the assignment variant based on the **last number of your birthdays’ day ex.: 31.12.2001 is the 1. variant.**

0.The main aim of the program is to read in a matrix of integers, find the sum of every row in the matrix and then display the initial matrix and an array, containing the sum of every row, at the output.

1.The main aim of the program is to read in a matrix of integers, find the sum of all the elements under the main diagonal of the matrix then display the initial matrix and the sum of all elements under the main diagonal at the output.

2. The main aim of the program is to read in a matrix of doubles, find the quotient of every column in the matrix and then display the initial matrix and an array, containing the quotient from every column, at the output.

3.The main aim of the program is to read in a matrix of integers, find the product of every column in the matrix and then display the initial matrix and an array, containing the products from every column, at the output.

4.The main aim of the program is to read in a matrix of doubles, find the difference of every row in the matrix and then display the initial matrix and an array, containing the difference from every row, at the output.

5.The main aim of the program is to read in a matrix of integers, find the sum of the main and secondary diagonal and then display the initial matrix and an array, containing the sum of the main and secondary diagonal, at the output.

6.The main aim of the program is to read in a matrix of floats, find the product of every positive element above the secondary diagonal in the matrix and then display the initial matrix and the product of every element above the secondary diagonal at the output.

7.The main aim of the program is to read in a matrix of floats, find the sum of every negative element in the matrix and then display the initial matrix and the sum of all negative elements at the output.

8.The main aim of the program is to read in a matrix of integers, find the difference of the main and secondary diagonal of the matrix and then display the initial matrix and an array, containing the difference of the main and secondary diagonal, at the output.

9.The main aim of the program is to read in a matrix of integers, find the quotient of the first and last row in the matrix and then display the initial matrix and an array, containing the quotient of the first and last row, at the output.