Prerequisites:

- Basic knowledge of using computer and text editor
- Knowledge how to create a program
- Knowledge how to create functions
- Knowledge of different types
- Knowledge about conditional statements
- Knowledge about loops (3 types)
- Knowledge about 1D and 2D arrays

Aims:

In this laboratory student will learn how to:

- use structures

1 Theoretical background

1.1 Structures

To define and initialize some structure the following source code should be provided:

```
struct Date
{
  unsigned char Day;
  enum Months Month;
  signed int Year;
};
```

From now `struct Date` is responsible for a new kind of data. It allows to save a lot of time (it is not required to repeat many times these three variables' types). Here was used enumerate type as well. `Months` could be defined as follows:

```
enum Months
{
  January = 1, Fabruary, March, April, May, June,
  July, August, September, October, November, December
};
```

To create in your program a new variable you can just do the following part of the source code:

```
struct Date DayOfBirth;
```

It is possible to define a new variable as well:

```
struct Date DayOfBirth = {26, March, 2018};
```

You can put any value to a particular field of this variable using the following peace of the source code:

```
struct Date DayOfBirth;
...
DayOfBirth.Day = 26;
DayOfBirth.Month = March;
DayOfBirth.Year = 2018;
```

If you want to read a particular field from this variable you can just do:

```
DayOfBirth.Year;
```

2 Exercises

1. Define a new structure called `Point` which will be responsible for storing X and Y coordinates. Ask used to give a relevant types of data, save them in newly created structure and then display it in the terminal.

2. Create now a new array of points. Ask user to give coordinates for five points. Now ask user if he/she want to display them sorted by X or by Y. According to user's decision display these points in the terminal in a proper order.

3. Create now a structure `Triangle` which will has three points, field and circuit. Ask user to give coordinates of these points. Your program will calculate circuit and field of this triangle. Finally display points, field and circuit of this triangle.

4. Draw in the terminal triangle from task no. 3.

5. Repeat task no. 3 and 4, however, this time for a rectangle.