06.06.2023

Introduction To Computer Programming
Laboratory 12

Labwork - 1

1. Write a computer program that receives your first name, last name, and date of birth and stores them in text file and reads the text file to display the information on console.

2. A person keeps tracks of his/her income and outcome in txt files. Data is entered per line as follows: dd.mm.yyy<tab>amount<tab>description string<newline>.
Text files are provided (Lab_12_soru2_ek_dosyalar). Write a program that receives filename and opens the expenses file.
Compute income, outcome and balance and append to the end of file.

3. Write C source code for a computer program that receives an unsigned integer from user and decomposes it to its digits and stores the digits in an array. If the entered value has n digits, the digits array should have n elements. The 0^{th} element of the digits array should be the units digit of the entered value. The 1^{st} element of the digits array should be the tens digit of the entered value an so on. After decomposition, save the number and its digits to a text file and print the digits array like example console output given below. Receiving integers should continue until zeros is being entered and each result should be added to the text file.

```
enter an unsigned integer: 123456
123456 = 1x10^5 + 2x10^4 + 3x10^3 + 4x10^2 + 5x10^1 + 6x10^0
```

4. Define a structure type named vector2_t which contains x and y components of a vector. Define a function to prompt user to enter x and y values for a vector. Define a function to print a vector on console. Define a function to compute sum of two vectors. Test your functions in a program that asks user how many vectors is going to be entered and then computes sum of all the vectors. Program should create an output like given below and information about points and summation should be added to the text file neatly.

```
how many vectors will be summed? 3

enter x component of vector: -1.1
enter y component of vector: -1.1

enter x component of vector: 2.2
enter y component of vector: 2.2

enter x component of vector: 3.3
enter y component of vector: 3.3

    (-  1.100x -  1.100y)
    (+  2.200x +  2.200y)
    (+  3.300x +  3.300y)
+_________________________
    (+  4.400x +  4.400y)
```

Labwork - 2

1. Receive an unsigned integer N as input. Generate N random numbers between [0-100] and store them in a text file. Put newline character between each generated number.

2. Write a computer program that receives file name as string. Open the file using the received string. Display count of numbers in the file. Find average of the numbers. Use the file generated by the previous program or create the text file manually.

3. Create a structure that consists cars for sale with feature of brand, model and price. Receive some cars' information and save them first in an array then a text file neatly.

4. Write C source code for a computer program that receives number of values user is going to enter (or generated randomly), allocates enough memory, receives values and save them in a text file, computes average and standard deviation by reading numbers from the text file and result should be added to the text file.

$$\sigma = \sqrt{\frac{\sum(x - x_{avg})^2}{N}};\quad \begin{matrix} x: every\ single\ value\ entered \\ x_{avg}: average\ of\ entered\ values \\ N: number\ of\ entered\ values \\ \sigma: standard\ deviation \end{matrix}$$