

PROGRAMMING TECHNIQUES, A.A. 2023/2024

Laboratory 0

Objectives

- First steps with Input/Output

Technical contents

- Definition and usage of integer, float, char variables
- I/O functions: *(f)scanf* and *(f)printf*, *(f)gets* and *(f)puts*, *(f)getc/getchar* and *(f)putc*
- Read data from file/keyboard – Print data on file/video
- Use of cast operators

NOTE: It is **HIGHLY RECOMMENDED** to **CREATE A NEW PROJECT FOR EACH AND EVERY EXERCISE**.

The name of the project should be: Lab<#lab_number>_<#ex_number>.

For example, for this lab, the name of the project should be **Lab00_1**.

Solve the following during the laboratory

Exercise 1. Using the IDE create a new project and write/build the following program in C language.
Check that there are no errors when you run the program.

Create a new File, named “Input.txt” in the main project directory.
The content of the file is this:

Tu, ancora inviolata sposa della quiete,
Figlia adottiva del tempo lento e del silenzio,
Narratrice silvana, tu che una favola fiorita
Racconti, piu' dolce dei miei versi,
Quale intarsiata leggenda di foglie pervade
La tua forma, sono dei o mortali,
O entrambi, insieme, a Tempo o in Arcadia?
E che uomini sono? Che dei? E le fanciulle ritrose?
Qual e' la folle ricerca? E la fuga tentata?
E i flauti, e i cembali? Quale estasi selvaggia?

This is instead the actual program code:

```
#include <stdio.h>
#define PINUMBER 3.14159

int main()
{
    FILE *fp_read, *fp_write;
    int num_int;
    double result;
    char letter, string[100 + 1];

    if ((fp_read = fopen("../Input.txt", "r")) == NULL)
    {
        printf("Error opening file\n");
        return 1;
    }

    if ((fp_write = fopen("../Output.txt", "w")) == NULL)
    {
        printf("Error opening file\n");
        return 2;
    }

    // scanf and printf integer
    printf("Enter a number:");
    scanf("%d", &num_int);
    fflush(stdin);
    printf("The number is: %d\n", num_int);
    fflush(stdout);

    // casting
    result = (double)(num_int) / 3 * PINUMBER;
    printf("The result is: %f\n", result);
    fflush(stdout);

    // scanf and printf char
    printf("Enter character one:");
    fflush(stdout);
    // scanf("%c", &letter);
    scanf(" %c", &letter);
    printf("The character is: %c\n", letter);
    fflush(stdout);

    // getchar and putchar character
    printf("Enter a character two:");
    letter = getchar();
    fflush(stdin);
    printf("The character is: ");
    putchar(letter);
    putchar('\n');
    fflush(stdout);

    // gets and puts string
    printf("Enter a string:");
    fflush(stdout);
```

```

//    getchar();
gets(string);
fflush(stdin);
printf("The string is: ");
puts(string);
fflush(stdout);

// copying character by character
// fgetc and fputc string
while (!feof(fp_read))
{
    letter = fgetc(fp_read);
    if (!feof(fp_read))
    {
        fputc(letter, fp_write);
    }
}

rewind(fp_read);
fputs("\n\n", fp_write);
fflush(fp_write);

// fgets and fputs string
while (!feof(fp_read))
{
    fgets(string, 20, fp_read);
    fputs("\n", fp_write);
    fflush(fp_write);
    fputs(string, fp_write);
    fflush(fp_write);
}

rewind(fp_read);
fputs("\n\n", fp_write);
fflush(fp_write);

// fscanf and fprintf string
while (!feof(fp_read))
{
    fscanf(fp_read, "%s", string);
    if (!feof(fp_read))
    {
        fprintf(fp_write, "%s", string);
    }
}

fclose(fp_read);
fclose(fp_write);

return 0;
}

```

Please try to compile and debug the given code, trying to understand what the program does and why.