Lab 6.1

> Several examples of using pointers in C.

```
int c, *pc;

// pc is address but c is not
pc = c;  // Error

// &c is address but *pc is not
*pc = &c;  // Error

// both &c and pc are addresses
pc = &c;  // Not an error

// both c and *pc are values
*pc = c;  // Not an error
```

Function 1 **(15 pts)**:

- Name of the function: print_size_and_content_of_5_different_data_types_and_their_addresses
- Return type: void
- Input parameters: none
- Format specifiers to be used: %d, %ld, %c, %f, %lf, %Lf, %p
- This function prints the data type, name, size, content and address of 5 different data types. The data types are char, int, float, double and long double. The result should be printed as follows:

```
variable type is char, name is char_var, size is 1 byte, content is 'a',
address is 0x7ffd4c7b1b0f

variable type is int, name is int_var, size is 4 byte, content is 5,
address is 0x7ffd4c7b1b10

....
```

Function 2 **(15 pts)**:

- Name of the function: swap_values_of_two_variables
- Return type: void
- Input parameters: 2 integers (a, b)
- This function swaps the values of two variables. The result should be printed as follows:

```
Before swap, a = 5, b = 10
After swap, a = 10, b = 5
```

Function 3 **(15 pts)**:

- Name of the function: swap_addresses_of_two_pointers
- Return type: void
- Input parameters: 2 pointers (pa, pb)
- This function swaps the addresses of two pointers. The result should be printed as follows:

```
Before swap, pa = 0x7ffd4c7b1b10, pb = 0x7ffd4c7b1b14
After swap, pa = 0x7ffd4c7b1b14, pb = 0x7ffd4c7b1b10
```

Function 4 **(15 pts)**:

- Name of the function: swap_values_of_two_pointers
- Return type: void
- Input parameters: 2 pointers (pa, pb)
- This function swaps the values of two pointers. The result should be printed as follows:

```
Before swap, *pa = 5, *pb = 10
After swap, *pa = 10, *pb = 5
```

Function 5 **(15 pts)**:

- Name of the function: print_array_without_using_index
- Return type: void
- Input parameters: 1 pointer (*arr), 1 integer (size)
- This function prints the elements of an integer array without using index. Hint: Use pointer arithmetic. The result should be printed as follows:

```
1. element of the array is 5 and its address in memory is 0x7ffd4c7b1b10
2. element of the array is 10 and its address in memory is 0x7ffd4c7b1b14
3. element of the array is 15 and its address in memory is 0x7ffd4c7b1b18
4. element of the array is 20 and its address in memory is 0x7ffd4c7b1b1c
...
```

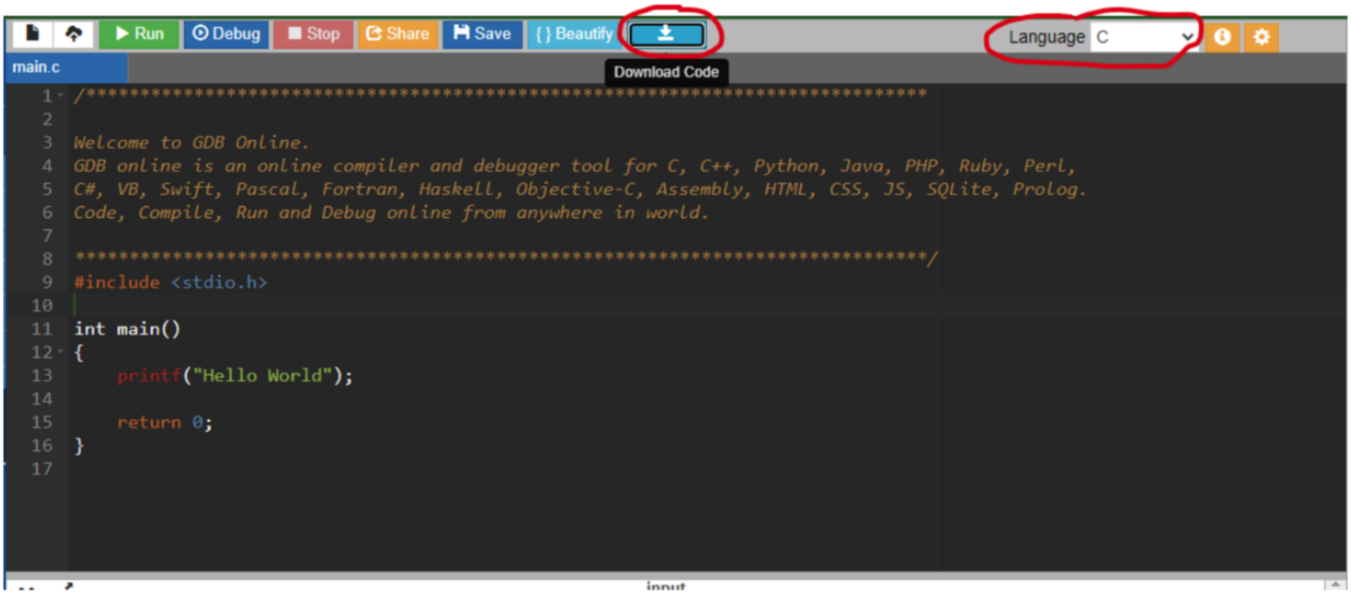
Main Function **(25 pts)**:

- Name of the function: main
- Return type: int
- Input parameters: none
- This function calls the other functions.
    - Call the function print_size_and_content_of_5_different_data_types_and_their_addresses
    - Declare 2 variables of type int and call the function swap_values_of_two_variables
    - Print the content of the variables declared in the previous step to see if they are swapped or not.

    - Declare 2 pointers of type int and assign them addresses of 2 variables of declared in the previous step.
        - Call the function swap_addresses_of_two_pointers
        - Call the function swap_values_of_two_pointers
    - Print the content of the variables declared in the previous step to see if they are swapped or not.
    - Declare an array of type int and call:
        - the function print_array_without_using_index

Restrictions

- If you are not sure something is free to use or not please ask your assistant
- You have to do your job by the functions given to you. If you complete the labwork without using functions, your work will not be graded.
- Mobile phone and internet usage are not allowed.
- You can only access yulearn and online c-compiler https://www.onlinegdb.com/
- Do not forget to select language if you use onlinegdb. When you finish your work, you can download your code by using download code button on top of the window.



```
/******************************************************************************

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C#, VB, Swift, Pascal, Fortran, Haskell, Objective-C, Assembly, HTML, CSS, JS, SQLite, Prolog.
Code, Compile, Run and Debug online from anywhere in world.

*******************************************************************************/
#include <stdio.h>

int main()
{
    printf("Hello World");

    return 0;
}
```

Submission

- Submit your C file with the format "name_surname.c" (use your name and surname)
- Do not submit a word document, text file or executable (a.out)