Basic Programming Lab

— — 0x0b

Pointer

// Program to create, initialise & access a pointer variable

```c
#include <stdio.h>
int main()
{
    int num;    //Declaration of integer variable
    int *ptr;   //Declaration of integer pointer
    ptr = &num; //Assigning address of num
    num = 20;   //Assigning 20 to variable num

    //Access value and address using variable num
    printf("\nUsing variable num:");
    printf("\nValue of variable num: %d", num);
    printf("\nAddress of variable num: %d", &num);

    //Access value and address using pointer variable num
    printf("\n\nUsing pointer variable: ");
    printf("\nValue of variable num: %d", *ptr);
    printf("\nAddress of variable num: %d", ptr);

    return 0;
}
```

sizeof function

//1. sizeof Data Type

```c
#include <stdio.h>
int main()
{
 printf("\nSize of char: %lu", sizeof(char));
 printf("\nSize of int: %lu", sizeof(int));
 printf("\nSize of float: %lu", sizeof(float));
 printf("\nSize of long int: %lu", sizeof(long int));
 printf("\nSize of double: %lu\n", sizeof(double));

        return 0;
}
```

//2. sizeof Pointer

```c
#include <stdio.h>
int main()
{
  printf("\nSize of char pointer: %lu", sizeof(char*));
  printf("\nSize of int pointer: %lu", sizeof(int*));
  printf("\nSize of float pointer: %lu", sizeof(float*));
  printf("\nSize of long int pointer: %lu", sizeof(long
int*));
  printf("\nSize of double pointer: %lu\n", sizeof(double*));
        return 0;
}
```

Call by Value

```c
#include <stdio.h>
void fun_value(int x)
{
        x = x + 1;
        printf("\nValue inside function %d", x);
}

int main()
{
        int a = 10;
        printf("\nBefore function calling: %d", a);
        fun_value(a);
        printf("\nAfter function calling: %d", a);
        return 0;
}
```

Call by Reference

```c
#include <stdio.h>
void fun_value(int* x)
{
        *x = *x + 1;
        printf("\nValue inside function %d", *x);
}

int main()
{
        int a = 10;
        printf("\nBefore function calling: %d", a);
        fun_value(&a);
        printf("\nAfter function calling: %d", a);
        return 0;
}
```

String and Pointer

```c
#include <stdio.h>
int main()
{
        char str[100];
        char *ptr;
        printf("\nEnter a string: ");
        scanf("%[^\n]s", str);

        //Asssign address of str to ptr
        ptr = str;
        printf("\nEntered string is: ");
        while (*ptr != '\0')
                printf("%c", *ptr++);
        return 0;
}
```

Assignment

//Use scanf for input in Every Program

1. Write a program to **swap** two numbers. (Call by Reference)

2. Write a program to **count vowels and consonants** in a string using pointer.

3. Write a program to print **a string in reverse** using a pointer.

Points to Remember

1. Filetype: .c

2. Naming Convention for Directory: Assignment_X
        where X = Lab No
        example: Assignment_1

3. Naming Convention for File: RollNo_Q_Y.c
        where Y = Question No in that Assignment
        example: 123XXX4567_Q_1.c

Commands:

	Command	Example
Create Directory	mkdir <directory_name>	mkdir test_directory
Create File	vi <filename>	vi test.c
Compile a C Program	gcc <filename>	gcc test.c
Run a C Program	./a.out	

4. Write your details in every program

```
/*
 -------------------------------------------------------
|Author : Your_Name                                     |
|Roll No: Your_Roll_No                                  |
|Department: Your_Department                            |
 -------------------------------------------------------
*/
```

5. Take string input with spaces type this:

```
        char str[100];
        scanf("%[^\n]s",str);
```