GALGOTIAS UNIVERSITY
Plot No.2, Sector -17 A, Yamuna Expressway,
Greater Noida, Gautam Buddha Nagar, U.P., India

SCHOOL OF COMPUTING SCIENCE & ENGINEERING

"LAB PRACTICAL FILE"

Course Name: TECHNICAL TRAINING-I
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Program: B. Tech

Submitted By:	Submitted To:
NEERAJ SINGH 21SCSE1011675 SEC-6- P1	Ravi Sharma SIR

List of Programs

1-) Write a program for swapping of two numbers

index.c | C | Run

```c
// Online C compiler to run C program online
#include <stdio.h>

int main()
{
int x, y;
printf("Neeraj Singh sec-6\n\n");
printf("Enter Value of x ");
scanf("%d", &x);
printf("Enter Value of y ");
scanf("%d", &y);
int temp = x;
x = y;
y = temp;

printf("\nAfter Swapping: x = %d, y = %d", x, y);
return 0;
}
```

Custom Input

```
[Success] Your code was executed successfully

Neeraj Singh sec-6

Enter Value of x Enter Value of y
After Swapping: x = 0, y = 0
```

2-) Write a program for Factorial number

index.c | C | Run

```c
// Online C compiler to run C program online
#include <stdio.h>

// function to find factorial of given number
unsigned int factorial(unsigned int n)
{
    if (n == 0)
        return 1;
    return n * factorial(n - 1);
}

int main()
{
    int num = 5;
    printf("Neeraj singh sec-6\n\n");
    printf("Factorial of %d is %d", num, factorial(num));
    return 0;
}

```

Custom Input

Output

```
[Success] Your code was executed
successfully

Neeraj singh sec-6

Factorial of 5 is 120
```

3-)Write a program for on switch-case, if-else and loop statements

index.cpp | C++ | Run

```cpp
#include <bits/stdc++.h>
using namespace std;
int main() {
    //while
    int num;
    cin>>num;
    switch(num){
        case 1:
        cout<<"number is one\n";
        break;
        default:
        cout<<"greater than one\n";
        break;
    }
    for(int i=0;i<num;i++){
        if(num==1){
            cout<<"Neeraj Singh sec-6\n";
        }
        else{
            cout<<"Wrong person\n";
        }
    }
    return 0;
}

```

Custom Input

```
1
```

```
[Success] Your code was executed
successfully

number is one
Neeraj Singh sec-6
```

4-)Write a program for nested for/while loop for printing pattern.

index.c | C | Run

```c
#include <stdio.h>
int main()
{
    int i=1,j=1;
    while (i <= 5)
    {
        j=1;
        while (j <= i )
        {
            printf("%d ",j);
            j++;
        }
        printf("\n");
        i++;
    }
    return 0;
}

```

Custom Input

Output

```
[Success] Your code was executed
successfully

1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```

5. Write a program for sum of diagonal elements

index.c | C | Run

```c
#include <stdio.h>
int main(){
    int i, j, m = 3, n = 3, a = 0, sum = 0;
    int matrix[3][3]
        = { { 1, 2, 3 }, { 4, 5, 6 }, { 7, 8, 9 } };
    if (m == n) {
        printf("The matrix is \n");
        for (i = 0; i < m; ++i) {
            for (j = 0; j < n; ++j) {
                printf(" %d", matrix[i][j]);
            }
            printf("\n");
        }
        for (i = 0; i < m; ++i) {
            sum = sum + matrix[i][i];
            a = a + matrix[i][m - i - 1];
        }
        printf("\nMain diagonal elements sum is = %d\n", sum);
        printf("Off-diagonal elements sum is = %d\n", a);
    }
    else
        printf("not a square matrix\n");
    return 0;
}
```

Custom Input

```
[Success] Your code was executed successfully

The matrix is
 1 2 3
 4 5 6
 7 8 9

Main diagonal elements sum is = 15
Off-diagonal elements sum is = 15
```

6. Write a program for sum of all the outside elements of a 2-D arrays.

index.cpp | C++ | Run

```cpp
#include <bits/stdc++.h>
using namespace std;
int main() {
    int matrix[3][3]={1,2,3,4,5,6,7,8,9};
    int sum=0;
    for(int i=0;i<3;i++){
        for(int j=0;j<3;j++){
            if(i==1 && j==1){}
            else{
                sum+=matrix[i][j];
            }
        }
    }
    cout<<"Neeraj Singh\n\n";
    cout<<"sum of all elements : "<<sum+matrix[1][1]<<endl;
    cout<<"sum of outer elements of array is: "<<sum<<endl;
    return 0;
}
```

Custom Input

```
1

[Success] Your code was executed successfully

Neeraj Singh

sum of all elements : 45
sum of outer elements of array is: 40
```

7. Write a program for based on sorting using recursive and non-recursive calls of function having pointer and arrays as an argument.

index.cpp | C++ | Run

```cpp
#include <bits/stdc++.h>
using namespace std;
void bubbleSort(int arr[],int n){  //non recursion
  for (int i = 0; i < n-1; i++)
     for (int j = 0; j < n-i-1; j++){
         if(arr[j] > arr[j+1])
             swap(arr[j], arr[j+1]);}}

void insertionSortRecursive(int arr[], int n){ //recursion
    if (n <= 1)
        return;
    insertionSortRecursive(arr, n - 1);
    int last = arr[n - 1];
    int j = n - 2;
    while (j >= 0 && arr[j] > last) {
        arr[j + 1] = arr[j];
        j--;}
    arr[j + 1] = last;}
int main() {
    int n;
    cin>>n;
    int arr[n];
    for(int i=0;i<n;i++){
        cin>>arr[i];
    }
    //bubbleSort(arr,n);
    cout<<"Neeraj singh sec-6\n\n";
    insertionSortRecursive(arr,n);
    for(int i=0;i<n;i++){
        cout<<arr[i]<<" ";}
    return 0;}
```

Custom Input

```
5
7
3
2
5
8
```

```
[Success] Your code was executed successfully

Neeraj singh sec-6

2 3 5 7 8
```

8. Problem based upon nested/ self-referential structure.

index.c | C | Run

```c

#include <stdio.h>
struct node {
    int data1;
    char data2;
    struct node* link;
};
int main(){
    struct node ob1; // Node1

    // Initialization
    ob1.link = NULL;
    ob1.data1 = 10;
    ob1.data2 = 20;

    struct node ob2; // Node2
    // Initialization
    ob2.link = NULL;
    ob2.data1 = 30;
    ob2.data2 = 40;

    // Linking ob1 and ob2
    ob1.link = &ob2;

    // Accessing data members of  ob2 using ob1
    printf("Neeraj singh sec-6\n");
    printf("%d", ob1.link->data1);
    printf("\n%d", ob1.link->data2);
    return 0;
}
```

Custom Input

```
[Success] Your code was executed successfully

Neeraj singh sec-6
30
40
```

9. Problem based upon Union, passing it as an argument inside the function

index.c | C | Run

```c
#include<stdio.h>
#include<string.h>

union Courses
{
    char  WebSite[50];
    char  Subject[50];
    int   Price;
};

void main( )
{
    union Courses C;

    strcpy( C.WebSite, "neeraj.in");
    printf( "WebSite : %s\n", C.WebSite);

    strcpy( C.Subject, "The C Programming Language");
    printf( "Book Author : %s\n", C.Subject);

    C.Price = 0;
    printf( "Book Price : %d\n", C.Price);
}
```

Custom Input

```
[Success] Your code was executed successfully

WebSite : neeraj.in
Book Author : The C Programming Language
Book Price : 0
```

10.Revision -Problem based upon classes and objects

index.cpp | C++ | Run

```cpp
#include <bits/stdc++.h>
using namespace std;
class Geeks{
    public:
    int id;

    Geeks()
    {
        cout << "Default Constructor called" << endl;
        id=-1;
    }

    Geeks(int x)
    {
        cout <<"Parameterized Constructor called "<< endl;
        id=x;
    }
};
int main() {

    Geeks obj1;
    cout <<"Neeraj singh: "<<obj1.id << endl;

    Geeks obj2(21);
    cout <<"Sec-6: " <<obj2.id << endl;
    return 0;
}
```

Custom Input

```
[Success] Your code was executed successfully

Default Constructor called
Neeraj singh: -1
Parameterized Constructor called
Sec-6: 21
```