NATIONAL UNIVERSITY OF COMPUTER AND EMERGING SCIENCES

PROGRAM: SOFTWARE ENGINEERING

DATA STRUCTURES LAB

LAB TASK-08

SUBMITTED BY:

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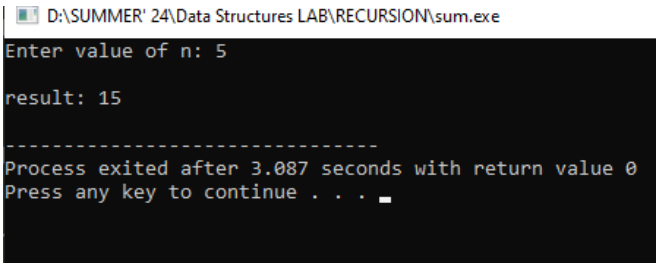
Q1 CODE (sum):

```
#include<iostream>

using namespace std;


int sum(int n)

{

	if(n==0)

	{

		return 0;

	}

	return n+(sum(n-1));

}


int main()

{

	int n;

	cout<<"Enter value of n: ";

	cin>>n;


	cout<<endl<<"result: "<<sum(n)<<endl;

	return 0;

}
```

Output-01:

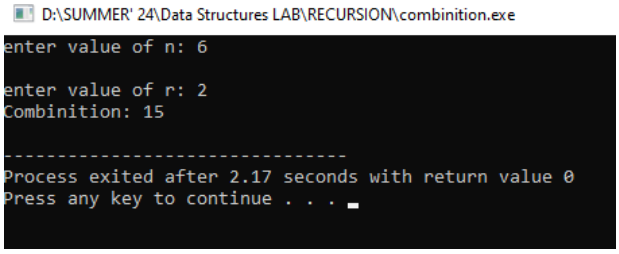


Q2 CODE (Combination):

```
#include<iostream>
using namespace std;

int factorial(int n)
{
	if(n==0||n==1)
	{
		return 1;
	}
	return n*factorial(n-1);
}
int combinition(int n, int r)
{
	return factorial(n)/(factorial(r)*factorial(n-r));
}

int main()
{
	int n,r;
	cout<<"enter value of n: ";
	cin>>n;
	cout<<endl<<"enter value of r: ";
	cin>>r;

	if(r>n)
	{
		cout<<endl<<"incorrect input"<<endl;
```

```
	}
	else
	{
		cout<<"Combinition: "<<combinition(n,r)<<endl;
	}
	return 0;
}
```

Output-02:

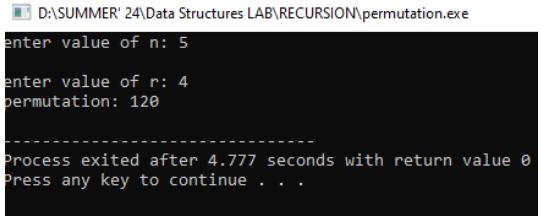


Q3 CODE (Permutation):

```
#include<iostream>
using namespace std;

int factorial(int n)
{
	if(n==0||n==1)
	{
		return 1;
	}
	return n*factorial(n-1);
}
int permutation(int n, int r)
```

```
{
	return factorial(n)/factorial(n-r);
}

int main()
{
	int n,r;
	cout<<"enter value of n: ";
	cin>>n;
	cout<<endl<<"enter value of r: ";
	cin>>r;
	if(r>n)
	{
		cout<<endl<<"incorrect input"<<endl;
	}
	else
	{
		cout<<"permutation: "<<permutation(n,r)<<endl;
	}
	return 0;
}
```

Output-03:



Q4 CODE (searching):

```
#include<iostream>
#include<cmath>
using namespace std;

void searching(int arr[], int start, int end, int val)
{
   if(start>end)
            {
      cout<<"not found"<<endl;
      return;
   }
   int n=floor((start+end)/2);
   if(arr[n]==val)
            {
      cout<<"found, index no. :"<<n<<endl;
      return;
   }
   else if(val>arr[n])
            {
      searching(arr,n+1,end,val);
   }
   else
            {
      searching(arr,start,n-1,val);
   }
}
```

```
void print(int arr[], int size)
{
   for(int i=0; i<size; i++)
           {
      cout<<arr[i]<<" ";
   }
   cout<<endl;
}

int main()
{
   int arr[8]={1, 2, 3 ,4, 5, 6, 7, 8};
   int size=sizeof(arr)/sizeof(arr[0]);
   int val=7;

   cout<<"Array is: "<<endl;
   print(arr,size);

   searching(arr,0,size-1,val);
   return 0;
}
```

Output-04: