Fundamentals of programming

Assignment 1

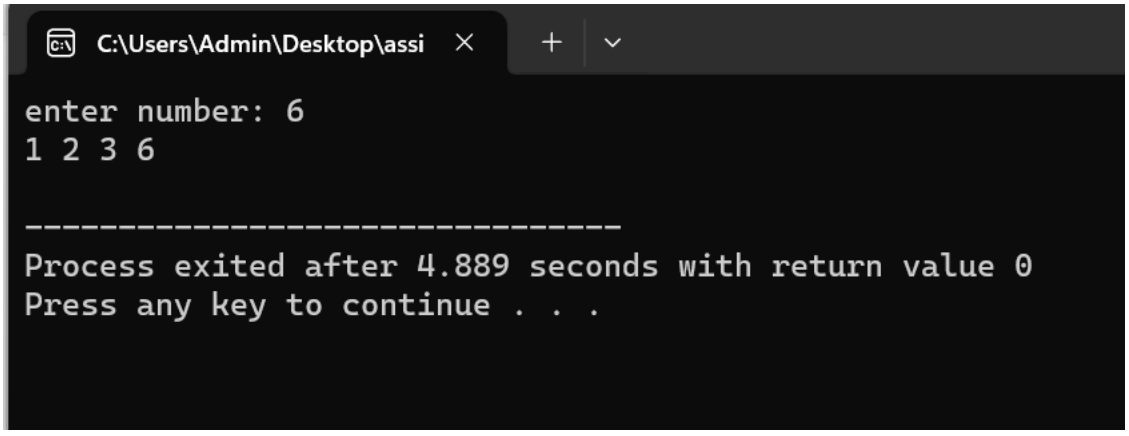
Muhammad Abdullah

ME-15 Section A

Qalam: 454502

1. **Write a C++ program to display factors of a number using for loops**.

```
int main(){
    int num;
    //asling user to enter number
    cout<<"enter number: ";
    cin>>num;
    //using for loop and if statement to find and display multiple factors
   for (int i = 1; i <= num; ++i) {
      if (num % i == 0) {
          cout << i << " "; }
   }
   cout << std::endl;
   return 0;
}
```



2. **Write output to the following code.**

```
#include <iostream>
int main() {
 int x = 5;
 int y = 10;
 if (x == 5)
```

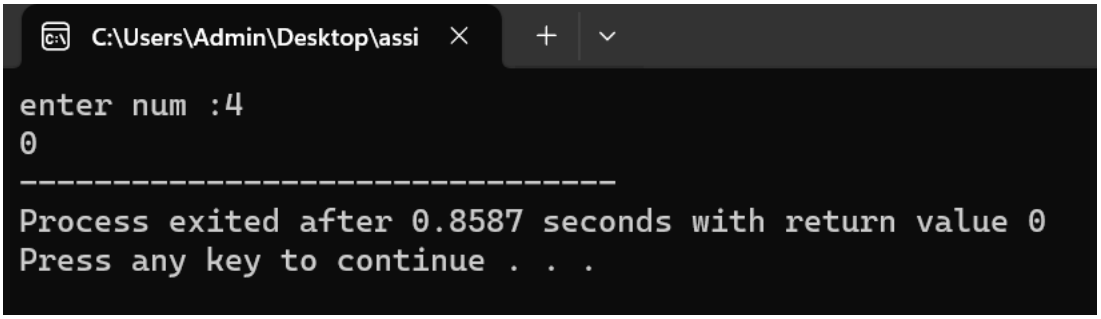
```
 if (y == 10)
 std::cout << "x is 5 and y is 10" << std::endl;
 else
 std::cout << "x is not 5" << std::endl;
 return 0;
}
```

Solution

Output will be “x is 5 and y is 10”

3. **Write a C++ program, take an integer value from user and check if it’s greater than 10 and less than equal to 20. Print 1 if yes and print 0 if no. Use appropriate datatype for output.**

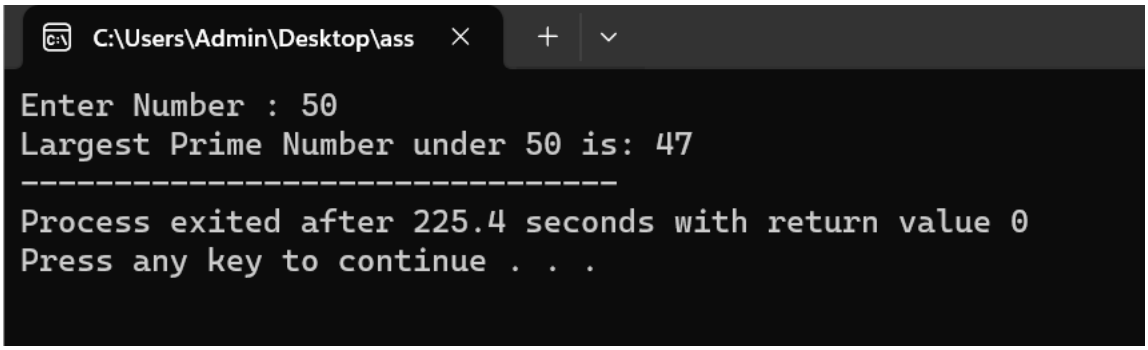
```
int main(){
        int num;
        bool range;

        cout<<"enter num :";
        cin>>num;
        if (num>10 && num<=20){
                cout<<1;
        }
        else{
                        cout<<0;
        }

        return 0;
}
```



4. **Write a C++ program that uses a while loop to find the largest prime number less than a given positive integer N. Your program should take the value of N as input from the user and then find the largest prime number less than or equal to N. You are not allowed to use any library or preexisting functions to check for prime numbers.**

```
int main(){ int N, i, j;
bool isyes=false;
cout<<"Enter Number : "; cin>>N;
i=N;
while(i>1){
j=i-1; isyes=false; while(j>1){
if(i%j==0){
//       cout<<i<<" "<<j<<endl;
isyes=false; break;
}
else if(i%j==1){
isyes=true;
```

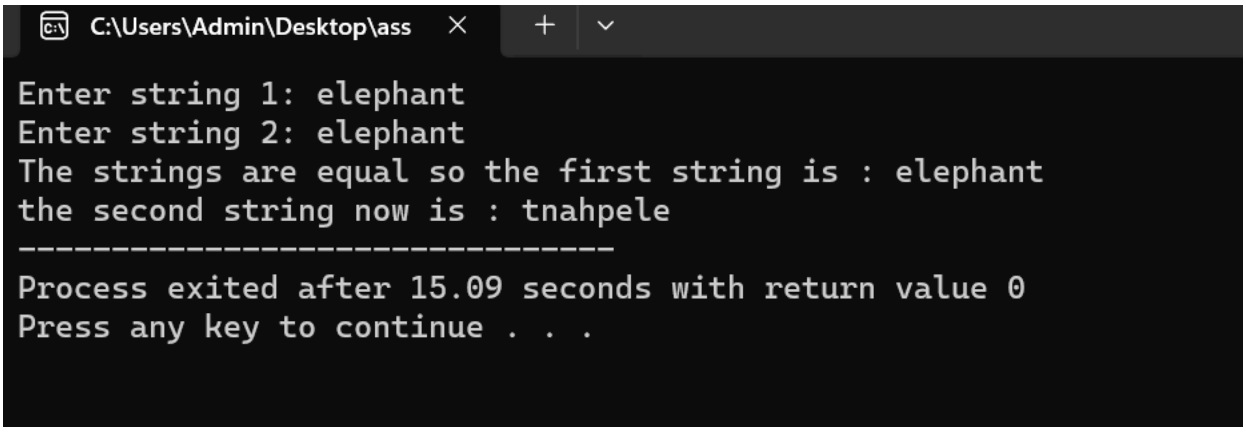
```
}
j--;
}

 if(isyes==true){
cout<<"Largest Prime Number under "<<N<<" is: "<<i; break;

}
i--;
}
}
```



5. **Write a C++ program, take two string as input from user and check if both strings are equal or not. If they are equal make them unequal by rotating stringe.g., Hello is turned into olleH etc.**

```
int main() {
   string string1, string2;
   int len2,i;
   string reverse2;
   //inputting strings
```

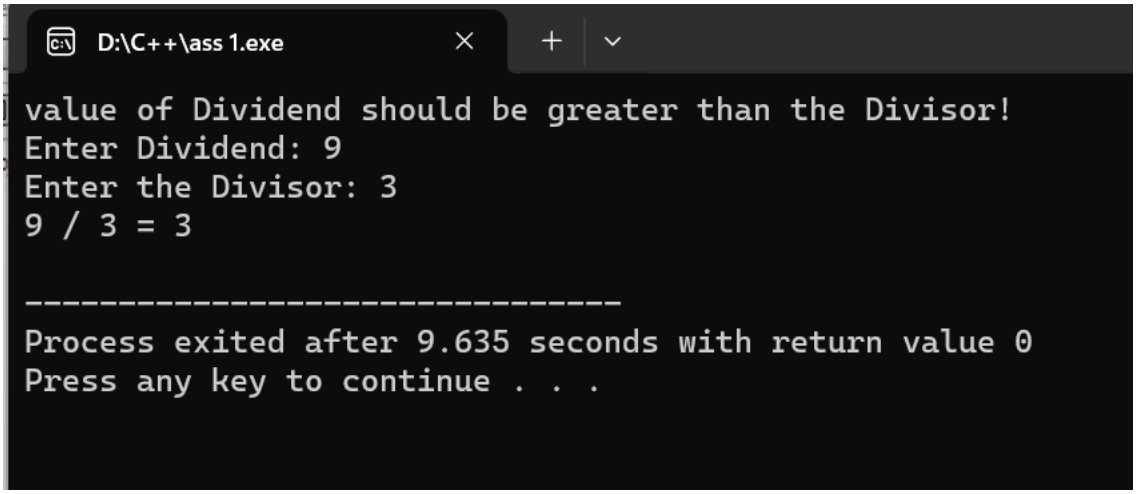
```
   cout << "Enter string 1: ";
   cin >> string1;
   cout << "Enter string 2: ";
   cin >> string2;
   //checking if they are equal and reversing them accordingly
   if(string1==string2)
   {
        len2 = string2.length();
        for( i=len2 - 1; i>=0; i--)
        {
                reverse2 += string2[i];
                }

                cout<<"The strings are equal so ";
                cout<<"the first string is : "<<string1<<endl;
                cout<<"the second string now is : "<<reverse2;

        }
        else
        {
                cout<<"The strings unequal";
        }
return 0;
}
```



6. **Perform division in C++ without / using for loops. You can use / only to display the final results. Your dividend must be greater than divisor.**

```
int main(){

int dividend=0, divisor=1, remainder, qout, res, count;

//validating dividend>divisor using while loop

 while(divisor>dividend){

cout<<"value of Dividend should be greater than the Divisor!"<<endl;
cout<<"Enter Dividend: ";

cin>>dividend;

 cout<<"Enter the Divisor: ";

 cin>>divisor;

}

//using for loop for division

for(count=1; count<=dividend; count++){ remainder=dividend%divisor;

res=(divisor*count)+remainder;

if(res==dividend){

qout=count;
```

```
break;
}
}
cout<<dividend<<" / "<<divisor<<" = "<<qout<<endl;
 if(remainder>0)
{
cout<<"The Remainder is: "<<remainder;
}
return 0;
}
```

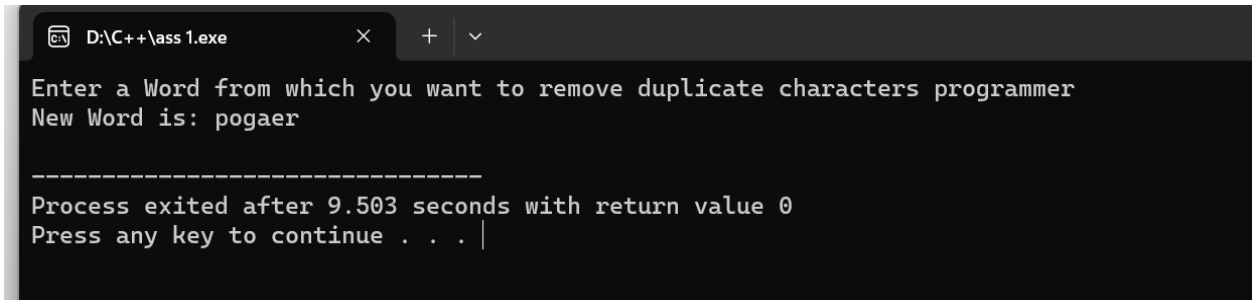


7. **Write a C++program for a string which may contain lowercase and uppercase characters. The task is to remove all duplicate characters from the string and find the resultant string.**

```
int main(){
string letter, newletter; int len, count, count2;
//asking user to enter word
cout<<"Enter a Word from which you want to remove duplicate characters ";
cin>>letter;
```

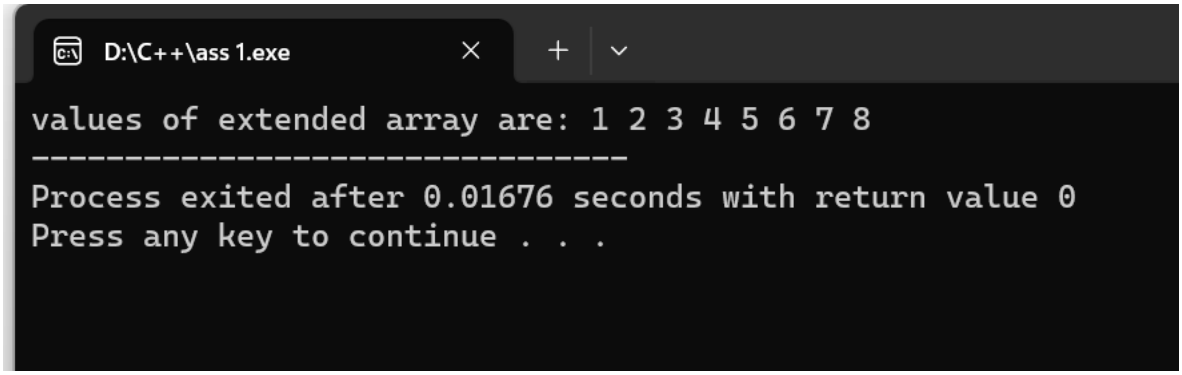
```
newletter=letter;
for(count=0; count<letter.length(); count++)
{ tolower(letter[count]);
for(count2=count+1; count2<=letter.length(); count2++ )
{ if(letter[count]==letter[count2]){
letter[count]=' ';
 letter[count2]=' ';

}
}
}
newletter="";
//using for loop to remove duplicates
for(count=0; count<letter.length(); count++)
{ if(isspace(letter[count])){
continue;

}s
else{
   newletter += letter[count];
}
}

newletter += letter[count];
cout<<"New Word is: "<<newletter<<endl;
```

}



8. Suppose an integer array a[5] = {1,2,3,4,5}. Add more elements to it and display them in C++.

```
int main(){
        int i,j,k;
        k=8;
        //initialzing array biger than 5 elements
        int a[k]={1,2,3,4,5,6,7,8};
        //outputting values of extended array
cout<<"values of extended array are: ";
        for (j=0;j<8;j++){
                cout<<a[j]<<" ";
        }

}
```

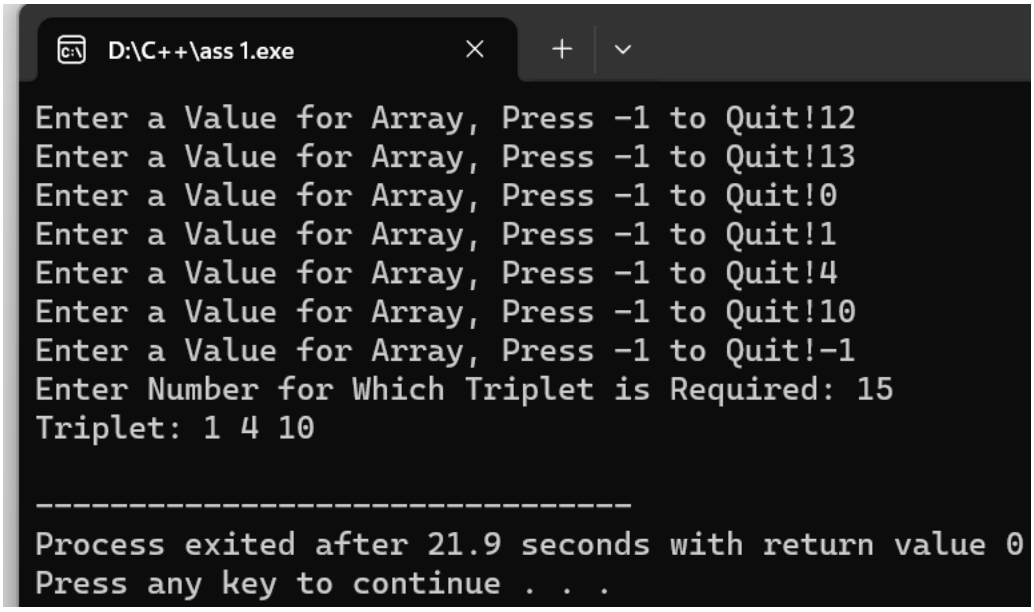


9 Given an integer array and an integer X. Find if there's a triplet in the array which sums up to the given integer X.

```
int main(){ int arr[10];
```

```
int X, inp=0, size, i=0; bool flag=false;
 while(inp != -1){
cout<<"Enter a Value for Array, Press -1 to Quit!";
cin>>inp;
if(inp==-1){
break;
}
else{
arr[i]=inp;
 i++;

}
}

cout<<"Enter Number for Which Triplet is Required: ";
cin>>X;
size=sizeof(arr)/sizeof(arr[0]);
 for (i = 0; i < size - 2; ++i) {
    for (int j = i + 1; j < size - 1; ++j) {
            for (int k = j + 1; k < size; ++k) {
if (arr[i] + arr[j] + arr[k] == X) {
cout << "Triplet: " << arr[i] << " " << arr[j] << " " << arr[k] << endl; flag=true;
}
}
}
```

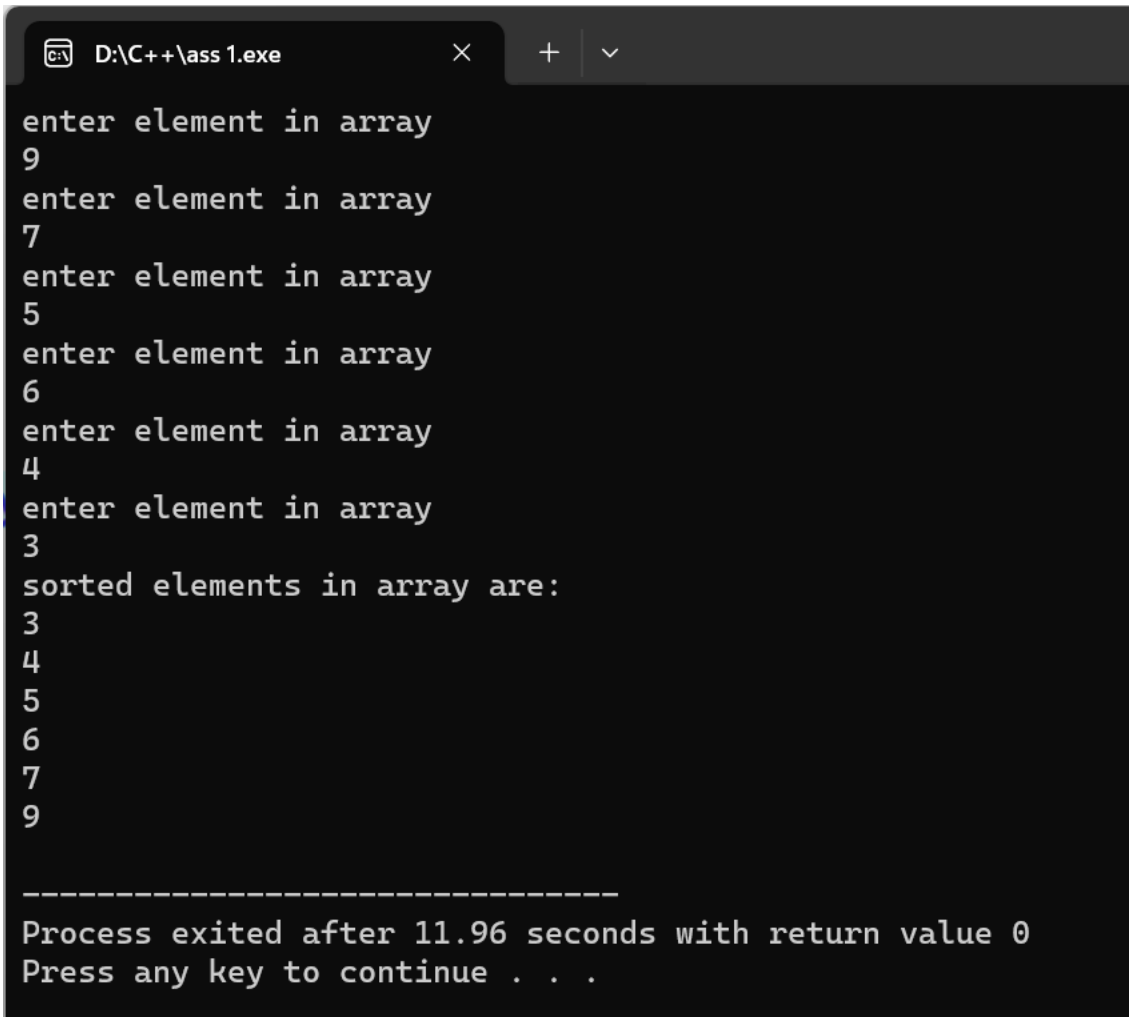
```
}
if(flag==false){
cout<<"Triplet not Found!";
}

}
```



10. Implement Bubble Sort on an array of 6 integers.

```
int main()
{int i,j,k,z,temp;
int num[6];
//entering elements in array
for(k=0;k<6;k++){
        cout<<"enter element in array"<<endl;
        cin>>num[k];
}
//bubble sorting using for loops
for(i=0;i<6;i++){
        for (j=0;j<6;j++){
                if (num[j]>num[j+1]){
```

```
                        temp=num[j];
                        num[j]=num[j+1];
                        num[j+1]=temp;}
                        else{continue;
                        }

        }

}
//displayimg sorted results
cout<<"sorted elements in array are: "<<endl;
        for(z=0;z<6;z++){
                cout<<num[z]<<endl;
        }

}
```


D:\C++\ass 1.exe
enter element in array
9
enter element in array
7
enter element in array
5
enter element in array
6
enter element in array
4
enter element in array
3
sorted elements in array are:
3
4
5
6
7
9

Process exited after 11.96 seconds with return value 0
Press any key to continue . . .