FUNDAMENTALS OF PROGRAMMING

ASSIGNMENT # 01

ABDUL MOIZ 464834 SECTION B

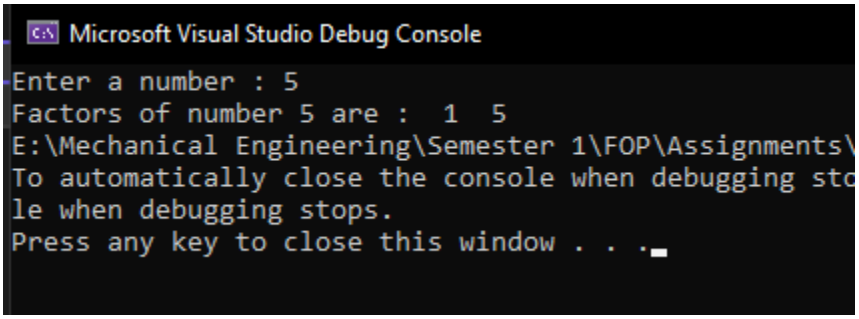
1. Write a C++ program to display factors of a number using for loops.

```
{// Question # 1
int num, n1;
cout << "Enter a number : ";
cin >> num;
cout << "Factors of number " << num<<" are :";
for (int j = 1; j <= 1; j++)
{
for (int i = 1; i <= num; i++)
{
if (num % i != 0)
{
continue;
}
if (num % i == 0)
{
cout<<setw(3) << i;
}
}
```

}

return 0;

}



2. Write output to the following code.

{ 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; }

OUTPUT

x is 5 and y is 10

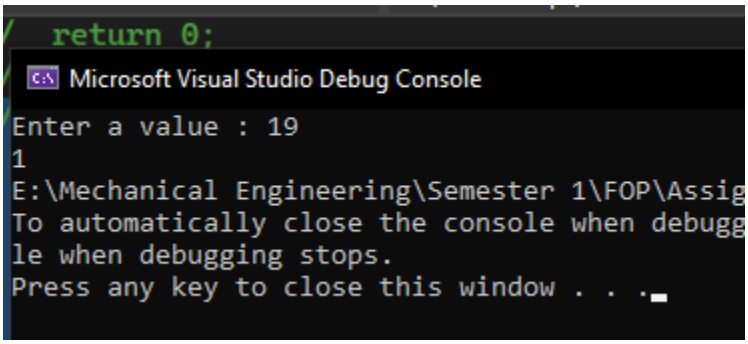
3. Write a C++ program, take an integer value from user and check if it's greater than 10 and less thanequal to 20. Print 1 if yes and print 0 if no. Use appropriate datatype for output.

{// Question # 3

int val,x=0,y=1;

cout << "Enter a value : ";

```
cin >> val;
if (val > 10 && val <= 20)
{
cout << ++x;
}
else
{
cout << --y;
}
return 0;
}
```



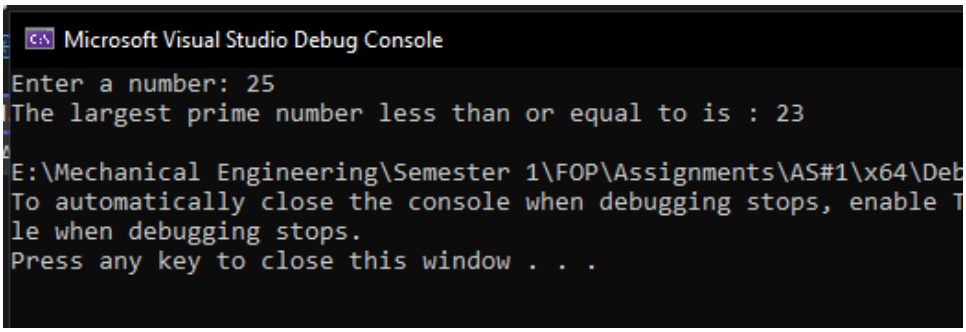
4. Write a C++ program that uses a while loop to find the largest prime number less than a given positive integer N. Your program should take the value of N as input from the user and then find the largest prime number less than or equal to N. You are not allowed to use any library or pre-existing functions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

```
{ // Question # 4
int N, check;
cout << "Enter a number: ";
```

```
cin >> N;
while (N >= 2)
{
check = 0;
for (int j = 1; j <= N; ++j)
{
if (N % j == 0)
{
check++;
}
}
if (check == 2)
{
cout << "The largest prime number less than or equal to is : " << N << endl;
break;
}
else
{
--N;
}
}
```

return 0;

}



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 string. e.g., Hello is turned into olleH etc.

{ // Question # 5

string str1, str2, reverse;

reverse = "";

cout << "Enter 1st String: ";

cin >> str1;

cout << "Enter 2nd String: ";

cin >> str2;

if (str1 == str2) {

for (int i = 0; i < str1.length(); i++) {

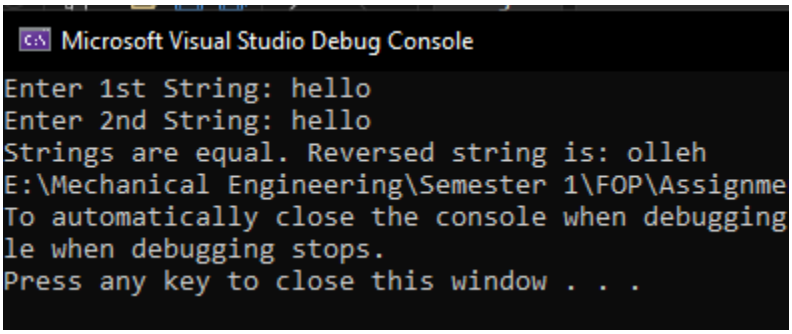
reverse = str1[i] + reverse;

}

cout << "Strings are equal. Reversed string is: ";

cout << reverse;

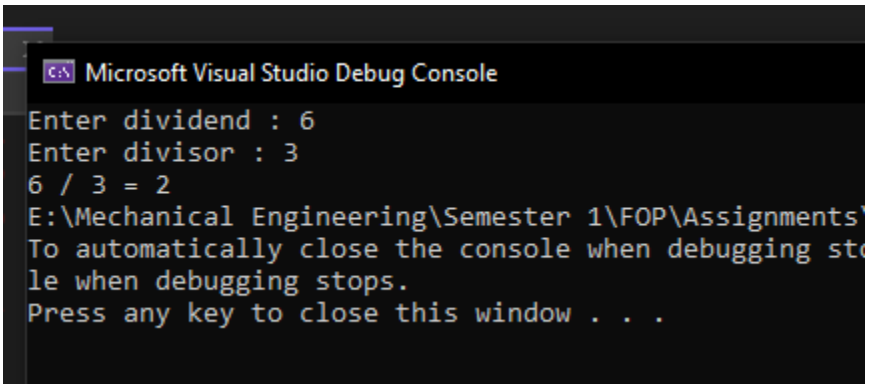
```
}
else {
cout << "The Strings are not equal";
}
return 0;
}
```



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.

```
{ // Questin # 6
int divd, div, r, q;
cout << "Enter dividend : ";
cin >> divd;
cout << "Enter divisor : ";
cin >> div;
if (div>divd) {
cout << "Enter a dividend greater than divisor.";
return 1;
}
```

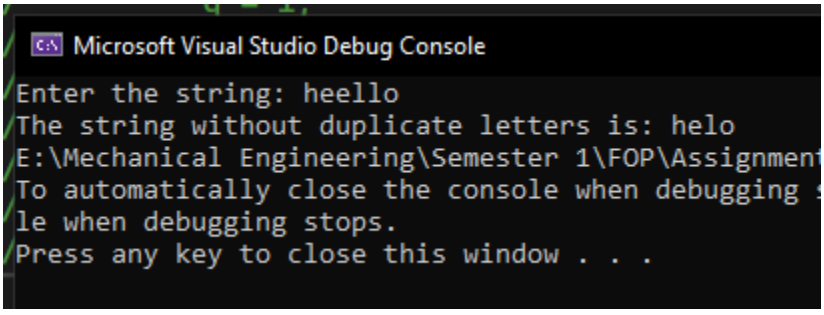
```
r = divd;
for (int i = 1; i <= divd; i++) {
r -= div;
if (div>r) {
q = i;
break;
}
}
cout << divd << " / " << div << " = " << q;
return 0;
}
```



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.

```
{ // Question # 7
string str1;
int length;
```

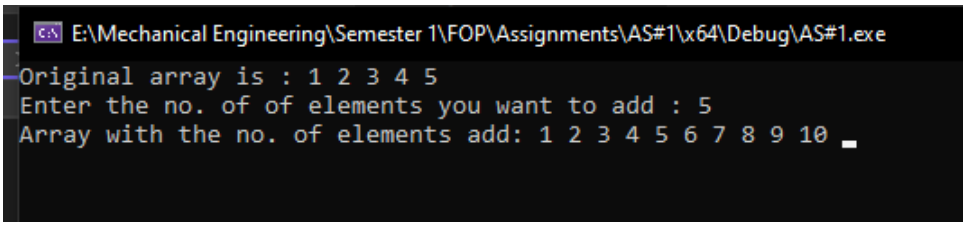
```
cout << "Enter the string: ";
getline(cin, str1);
length = str1.length();
for (int i = 0; i <= length; i++) {
for (int j = 0; j <= length; j++) {
if (tolower(str1[i]) == tolower(str1[j]) && i != j) {
str1.erase(j, 1);
j--;
length = str1.length();
}
}
}
cout << "The string without duplicate letters is: " << str1;
return 0;
}
```



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

```
{ // Question # 8
```

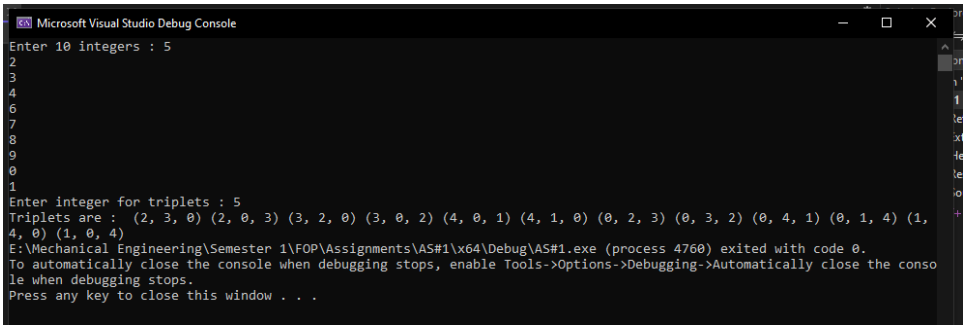
```
int n, a[5] = { 1,2,3,4,5 };
cout << "Original array is : ";
for (int i = 0; i < 5; i++) {
cout << a[i] << " ";
}
cout << endl;
cout << "Enter the no. of of elements you want to add : ";
cin >> n;
for (int i = 5; i < 5 + n; i++) {
a[i] = i + 1;
}
cout << "Array with the no. of elements add: ";
for (int i = 0; i < 5 + n; i++) {
cout << a[i] << " ";
}
return 0;
}
```



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.

```
{ // Question # 9
int a, b, c, X, sum, arr[10];
cout << "Enter 10 integers : ";
for (int i = 0; i < 10; i++) {
cin >> arr[i];
}
bool found = false;
cout << "Enter integer for triplets : ";
cin >> X;
cout << "Triplets are : ";
for (int i = 0; i < 10; i++) {
for (int j = 0; j < 10; j++) {
if (i == j)
continue;
for (int z = 0; z < 10; z++) {
if (z == i || z == j)
continue;
sum = arr[i] + arr[j] + arr[z];
if (sum == X) {
cout << " (" << arr[i] << ", " << arr[j] << ", " << arr[z] << ")";
found = true;
}
```

```
}
}
}
if (found == false) {
cout << "No Triplets Found";
}
return 0;
}
```



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

```
{ // Question # 10
int temp, x = 6, arr[6];
cout << "Enter six integers for array: ";
for (int i = 0; i < x; i++) {
cin >> arr[i];
}
for (int j = 0; j < (x - 1); j++) {
for (int i = 0; i < (x - 1); i++) {
if (arr[i] > arr[i + 1]) {
temp = arr[i];
```

```
arr[i] = arr[i + 1];
arr[i + 1] = temp;
}
}
}
cout << "Final Array is: {";
for (int i = 0; i < x; i++) {
cout << arr[i];
if (i == x - 1)
continue;
cout << ",";
}
cout << "}";
return 0;
}
```