DSA BOOTCAMP ASSIGNMENT

Q1. Write a program to Swap to two numbers.

INPUT:

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

int main()
{
    int a = 5, b = 10, temp;

    cout << "Before swapping." << endl;
    cout << "a = " << a << ", b = " << b << endl;

    temp = a;
    a = b;
    b = temp;

    cout << "\nAfter swapping." << endl;
    cout << "a = " << a << ", b = " << b << endl;

    return 0;
}
```

OUTPUT:

```
Before swapping.
a = 5, b = 10

After swapping.
a = 10, b = 5
```

Q2. Write a program to find the largest number among three numbers entered by the user.

INPUT:

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

```cpp
int main() {
    float n1, n2, n3;

    cout << "Enter three numbers: ";
    cin >> n1 >> n2 >> n3;

    if(n1 >= n2 && n1 >= n3)
        cout << "Largest number: " << n1;

    if(n2 >= n1 && n2 >= n3)
        cout << "Largest number: " << n2;

    if(n3 >= n1 && n3 >= n2)
        cout << "Largest number: " << n3;

    return 0;
}
```

OUTPUT:

```
Enter three numbers: 2.3
8.3
-4.2
Largest number: 8.3
```

Q3. Write a program to check whether a year entered by a user is Leap year or not.

INPUT:

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

int main() {
    int year;

    cout << "Enter a year: ";
    cin >> year;

    if (year % 4 == 0) {
        if (year % 100 == 0) {
            if (year % 400 == 0)
                cout << year << " is a leap year.";
            else
```

```cpp
                cout << year << " is not a leap year.";
        }
        else
            cout << year << " is a leap year.";
    }
    else
        cout << year << " is not a leap year.";

    return 0;
}
```

OUTPUT:

```
Enter a year: 2014
2014 is not a leap year.
```

Q4. Write a program to display Fibonacci Series upto nth term. (Using loops)

INPUT:

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

int main() {
    int n, t1 = 0, t2 = 1, nextTerm = 0;

    cout << "Enter the number of terms: ";
    cin >> n;

    cout << "Fibonacci Series: ";

    for (int i = 1; i <= n; ++i) {
        // Prints the first two terms.
        if(i == 1) {
            cout << t1 << ", ";
            continue;
        }
        if(i == 2) {
            cout << t2 << ", ";
            continue;
        }
        nextTerm = t1 + t2;
        t1 = t2;
```

```
        t2 = nextTerm;

        cout << nextTerm << ", ";
    }
    return 0;
}
```

OUTPUT:

```
Enter the number of terms: 10
Fibonacci Series: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34,
```

Q5. Write a program to check whether a number is Prime or Not.

INPUT:

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

int main() {
    int i, n;
    bool isPrime = true;

    cout << "Enter a positive integer: ";
    cin >> n;

    // 0 and 1 are not prime numbers
    if (n == 0 || n == 1) {
        isPrime = false;
    }
    else {
        for (i = 2; i <= n / 2; ++i) {
            if (n % i == 0) {
                isPrime = false;
                break;
            }
        }
    }
    if (isPrime)
        cout << n << " is a prime number";
    else
        cout << n << " is not a prime number";
```

```
    return 0;
}
```

```
Enter a positive integer: 29
29 is a prime number.
```

Q6. Write a program that takes n elements from the user and displays the second largest element of an array.

INPUT:

```cpp
#include <iostream>
using namespace std;
int main(){
    int n, num[50], largest, second;
    cout<<"Enter number of elements: ";
    cin>>n;
    for(int i=0; i<n; i++){
        cout<<"Enter Array Element"<<(i+1)<<": ";
        cin>>num[i];
    }
    /* Here we are comparing first two elements of the
     * array, and storing the largest one in the variable
     * "largest" and the other one to "second" variable.
     */
    if(num[0]<num[1]){
        largest = num[1];
        second = num[0];
    }
    else{
        largest = num[0];
        second = num[1];
    }
    for (int i = 2; i< n ; i ++) {
        /* If the current array element is greater than largest
         * then the largest is copied to "second" and the element
         * is copied to the "largest" variable.
         */
        if (num[i] > largest) {
            second = largest;
            largest = num[i];
        }
        /* If current array element is less than largest but greater
         * then second largest ("second" variable) then copy the
         * element to "second"
         */
        else if (num[i] > second && num[i] != largest) {
```

```cpp
            second = num[i];
        }
    }
    cout<<"Second Largest Element in array is: "<<second;
    return 0;
}
```

OUTPUT:

```
Enter number of elements: 5
Enter Array Element1: 12
Enter Array Element2: 31
Enter Array Element3: 9
Enter Array Element4: 21
Enter Array Element5: 3
Second Largest Element in array is: 21
```