

* DSA - DAY - 4 : Some Basic C++
Programs & Practice Work

* Prog 1 :- Odd & even

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

int main () {
    int num;
    cout << "Enter a number : ";
    cin >> num;
    if (num % 2 == 0) {
        cout << "The number is even ";
    } else {
        cout << "The number is odd ";
    }
    return 0;
}
```

⇒ Output 1 :-

Enter the number :- 5
the number is odd.

⇒ Output 2 :-

Enter the number :- 6
the number is even

prog 2 :- printing of lowercase, uppercase and digit through output & if else.

```
#include <iostream>
using namespace std;
int main() {
    char A;
    cout << "Enter the character :- ";
    cin >> A;
    if (A >= 'a' && A <= 'z') {
        cout << "Lowercase ";
    }
    else if (A >= 'A' && A <= 'Z') {
        cout << "Uppercase ";
    }
    else if (A >= '0' && A <= '9') {
        cout << "Digits ";
    }
    else {
        cout << "Special characters ";
    }
    return 0;
}
```

⇒ output :-
Enter the character :- A
Uppercase

* prog 3 :- Sum of n natural no.

```
#include <iostream>
using namespace std;
int main() {
    int n, sum = 0;
    cout << "Enter the number:- ";
    cin >> n;

    for (int i = 1; i <= n; i++) {
        sum = sum + i;
    }
    cout << "Sum:- " << sum;
    return 0;
}
```

⇒ output:-

Enter the number:- 5
Sum:- 15

* prog 4 :- sum of all even numbers

```
#include <iostream>
using namespace std;
int main() {
    int n, sum = 0;
    cout << "Enter the number:- ";
    cin >> n;

    for (int i = 1; i <= n; i++) {
        if (i % 2 == 0) {
            sum = sum + i;
        }
    }
}
```

cout << sum of even numbers :-
<< endl;

return 0;

}

⇒ output :-

Enter the number :- 10

sum of even number :- 30

* prog 5 :- prime numbers.

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

int main () {
    int num, i;
    bool isprime = true;
    cout << "Enter a number :- ";
    cin >> num;
    if (num <= 1) {
        isprime = false;
    } else {
        for (int i = 2; i <= sqrt(num); i++) {
            if (num % i == 0) {
                isprime = false;
                break;
            }
        }
    }
    if (isprime) {
        cout << num << " is a prime number" << endl;
    }
}
```

3 else {
 cout << num << " is not a
 prime number" ; }

→ output :-

Enter a number : - 3

3 is a prime number.

* prog 6 :- prime number between two numbers.

```
#include <iostream>
using namespace std;
int main() {
    int l, u, i, j;
    cout << "Enter the lower limit"
    cin >> l;
    cout << "Enter the upper limit"
    cin >> u;
    for (i = l + 1; i <= u - 1; i++) {
        for (j = 2; j < i; j++)
            if (i % j == 0)
                break;
        if (i == j)
            cout << j << endl;
    }
    return 0;
}
```

→ output :-

Enter lowerlimit :- 10

Enter upperlimit :- 20

11

13

17

19

→ Dry run.

$$l = 10, u = 20$$

$$i = l + 1 \Rightarrow 11$$

$$j < u \Rightarrow 19$$

$$j = 2$$

$$j < 11$$

$$\text{if } (11 \% 2 == 0) \rightarrow \text{false}$$

$$j = 3 \quad \text{if } (11 \% 3 == 0) \rightarrow \text{false}$$

$$j = 4 \quad \text{if } (11 \% 4 == 0) \rightarrow \text{false}$$

$$j = 5 \quad \text{if } (11 \% 5 == 0) \rightarrow \text{false}$$

$$j = 6 \quad \text{if } (11 \% 6 == 0) \rightarrow \text{false}$$

$$j = 7 \quad \text{if } (11 \% 7 == 0) \rightarrow \text{false}$$

$$j = 8 \quad \text{if } (11 \% 8 == 0) \rightarrow \text{false}$$

$$j = 9 \quad \text{if } (11 \% 9 == 0) \rightarrow \text{false}$$

$$j = 10 \quad \text{if } (11 \% 10 == 0) \rightarrow \text{false}$$

$$j = 11 \quad \text{if } (11 \% 11 == 0) \rightarrow \text{TRUE}$$

false

loop exist

$$j = 11, j = 11$$

Print 11

$i = 12$ $j < 19$ $j = 3$ $j < 12$

$j = 3 \Rightarrow$ if $(12 \times 2) \neq 0 \Rightarrow$ false
 $\text{if } (12 \times 3) \neq 0 \Rightarrow$ true.

break

Q It is used to jump
out of the loop.

$\text{if } (12 == 3) \Rightarrow$ false.

loop exits. $i = 13, j < 19$ $j = 4 \quad | j < 12$

$j = 4 \quad \text{if } (13 \times 4) \neq 0 \Rightarrow$ false.

$\text{if } (13 \times 13) \neq 0 \Rightarrow$ false.

loop exits.

$\text{if } (13 == 13) \Rightarrow$ true

print 13

& so on.