

## Loop Advance

① Print 100 to 200

```
for(int i=100; i<=200; i++)
{
    cout << i << " ";
}
```

② Print a to z.

a = 97

char name = 'a'  
'a'+1 = 'b'

```
for(char name='a'; name<='z'; name++)
{
    cout << name << " ";
}
```

③ n = 10

print → 10, 9, 8, ..., 1

↑

① i = 10

② i ≥ 1

③ print i

④ i = i - 1

```
for(int i=10; i>=1; i--)
{
    cout << i << " ";
}
```

iv) Print 1-100

e.g. 1, 4, 7, 10, 13, ...  
 $\underbrace{\quad\quad\quad}_3 \quad \underbrace{\quad\quad\quad}_3 \quad \underbrace{\quad\quad\quad}_3$

(i)  $i = 1$

(ii)  $i \leq 100$   $\text{cout} \ll \text{print } i$

(iii)  $i = i + 3$

```
for(i=1; i<=100; i=i+3)
{ cout << i << " "; }
```

v) Print table of n.

e.g. Method - I

$n = 6$

$6 \times 1 = 6$

$6 \times 2 = 12$

$6 \times 3 = 18$

$\vdots$

$6 \times 10 = 60$

(i)  $\text{start} = n$

(ii)  $i = 1$

(iii)  $i \leq 10$

(iv)  $n \times i = n$

(v)  $i++$

```
for(i=1; i<=10; i++)
```

```
{
```

```
cout << n << "*" << i << "x" << n << " ";
```

```
}
```

Method - II

$\text{start} \leftarrow 6$

12

18

$\vdots$

$\text{stop} \leftarrow 60$

```
for(i=6; i<=60; i+=6)
```

```
{
```

```
cout << i << " ";
```

```
}
```

In general,

```
for(int i=n; i<=n*10; i=i+n)
```

```
{ cout << i;
```

Refer code: 03-Question on Loop/class code/ForLoop.CPP



(vi) Power

$$n = 5, \text{ Pow} = 4$$

e.g.  $5^4 = 625$

$$\begin{array}{c} \downarrow \\ 5 \times 5 \times 5 \times 5 \\ \hline 2 \quad 3 \end{array}$$

<p>(i) <math>n = 6, \text{ Pow} = 5</math></p> <p>(ii) <math>\text{num} = n</math></p> <p>(iii) <math>i = 1</math></p> <p>(iv) <math>i &lt; \text{Pow}</math></p> <p>(v) <math>\text{num} = \text{num} \times n</math></p> <p>(vi) <math>i = i + 1</math></p>	<pre>int n, Pow; cin &gt;&gt; n &gt;&gt; Pow; int num = n;  for(i = 1; i &lt; Pow; i++) {     num = num * n; }  cout &lt;&lt; num;</pre>
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Refer code: 03-Question on loop/class code/Power of N.cpp

(vii) Sum of n natural no.

$$n = 6$$

$$\text{Sum} = 0$$

$$\text{Sum} = 0 + 1 + 2 + 3 + 4 + 5 + 6 = 21$$

$$\text{Sum} + 1 = 0 + 1 = 1$$

$$\text{Sum} + 2 = 1 + 2 = 3$$

$$\text{Sum} + 3 = 3 + 3 = 6$$

$$\text{Sum} + 4 = 6 + 4 = 10$$

$$\text{Sum} + 5 = 10 + 5 = 15$$

$$\text{Sum} + 6 = 15 + 6 = 21$$

$$\text{Sum} = 0$$

for(i = 1; i <= n; i++)

{

$$\text{Sum} = \text{Sum} + i;$$

}

cout << Sum;

Refer code: 03-Question on loop/class code/Sum of Natural.cpp

Method - 2

$$\text{cout} << \frac{n \times (n+1)}{2};$$

viii) Sum of square of  $n$ . H/W

$$1^2 + 2^2 + 3^2 + 4^2 + \dots + n^2$$

$$\text{sum} = \text{sum} + i \times i$$

ix) Factorial of  $n$

$$n = 5$$

$$\text{fact} = 1 \times 2 \times 3 \times 4 \times 5 = 120$$

$$\textcircled{i} \quad i = 1$$

$$\textcircled{ii} \quad i \leq 5$$

$$\text{fact} = \text{fact} \times i$$

$$\textcircled{iii} \quad i++;$$

$$\text{fact} = 1$$

$$\text{for}(i=1; i \leq n; i++)$$

$$\text{fact} = \text{fact} \times i;$$

$$\text{cout} << \text{fact};$$

Refer code: 03-Question on Loop/class code/factorial.cpp.

x) prime no.

Divisible by 1 or itself only.

$$2 \leq n-1$$

$$n \leq 2$$

↑ not prime.

$$\text{if}(n < 2)$$

{ cout << "not prime";  
return 0;

else {

$$\text{for}(i=2; i \leq n; i++)$$

$$\{ \text{if}(n \% i == 0)$$

cout << "not prime";

cout << "prime";



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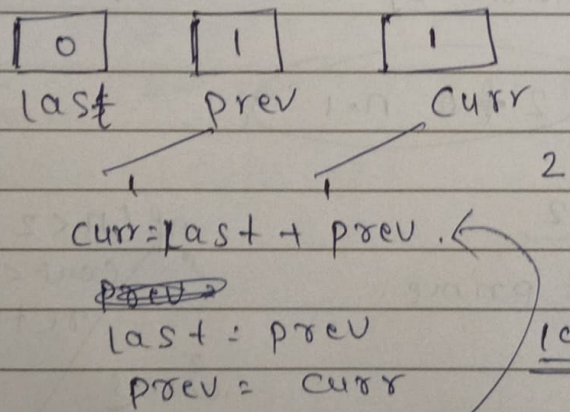
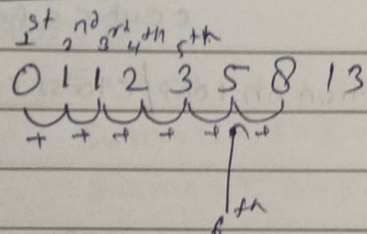
```

if (n < 2)
{
    cout << "Not Prime";
    return 0; ← end program
}
else
{
    for (i = 2; i < n; i++)
    {
        if (n % i == 0)
        {
            cout << "Not Prime";
            return 0; ← end program.
        }
    }
    cout << "Prime";
}
  
```

Refer code: 03-Question on Loop/class code/prime.cpp

### (X1) Fibonacci Series

H/W



Refer code: 03-Question on Loop/class code/fibonacci.cpp