

# Control Statement - Solve Common Problems with Easy Solutions

## 1. Print Fibonacci series up to N terms

$n = 5 \Rightarrow$



$n = 10$

0 1 1 2 3

control

$\Rightarrow$  0 1 1 2 3 5 8 13 21 34  
1 2 3 4 5 6 7 8 9 10

Recursive \*

user  $n = 5$  (0 1 1 2 3)  
first sec third

first = 0  $\Rightarrow$  t1

sec = 1  $\Rightarrow$  t2

int nextterm;

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

if (i == 1) {  
cout << t1 << " ";

else if (i == 2) {  
cout << t2 << " ";  
else {

nextterm = t1 + t2;  
cout << nextterm

t1 = t2; //

t2 = nextterm; //

}

$n = 1$

$n = 2$

$n = 3$

$n = 1$

0

$1 <= 1$

1 2 3 4 5

$n = 5$

$n = 1$

$i = 1$

$i = 2$

0 1

$n = 4$

1)  $i = 1$

2)  $1 <= 2$  ✓

3)  $1 = 1$  ✓

4)  $i = 2$

5)  $2 = 2$  ✓

6)  $2 = 1$  ✗

7)  $2 = 2$  ✓

8)  $i = 3$

9)  $3 <= 3$  ✓

10)  $3 = 1$  ✗

11)  $3 = 2$  ✗

12)  $0 + 1 = 1$

13)  $i = 4$

14)  $i <= 4$  ✓

15) 2

16)  $t1 = 1$   
 $t2 = 2$

output  
0 1 1 2  
t1 t2

0 1 2  
t1 t2

## 2. Reverse a number and check if it is palindrome or not

1 2 3 } not  
0  
3 2 1

(or == R)

number  $\Rightarrow$  5 4 4 5  
rev  $\Rightarrow$  5 4 4 5

palindrome

121  $\rightarrow$  palin  
121



121

num  $\div 10 \Rightarrow$  last digit  
num  $\div 10 \Rightarrow$  remaining  
12  $\rightarrow$  quotient

user  
num = 121, original = num, reversed = 0, rem;

while (num != 0) {

rem = num  $\div 10$ ;

reversed = reversed  $\times 10$  + rem;  $\frac{121}{121}$

num = num  $\div 10$ ;

}

if (original == reversed) {

Palindrome;

} else

{ Not Palindrome.

}

rem = 9.

rem = 0 last  
first

0  $\times 10$   
0 + 1  $\Rightarrow$  1

$\Rightarrow$  2

(12)

1  $\times 10$

10 + 2  $\Rightarrow$  12

121

12  $\times 10 \Rightarrow$  120 +

$\Rightarrow$  121 //

10  $\overline{) 121}$   
21  
20  
1  $\rightarrow$  remainder (%)

{ 1234  $\Rightarrow$  4  
121  $\Rightarrow$  3

1234  
4321

rem = 1  $\times 10$  + rem  
 $\Rightarrow$  0 + 10 + 1  
rem = 0 + 1  
num  $\Rightarrow$  12

1) 12  $\neq$  0  $\checkmark$

rem = 2

num = 1  $\times 10$  + 2

$\Rightarrow$  10 + 2  $\Rightarrow$  12

num  $\Rightarrow$  1

2) 1  $\neq$  0  $\checkmark$

rem = 1

num = 12  $\times 10$  + 1

= 120 + 1  $\Rightarrow$  121

num = 0

3) 0  $\neq$  0  $\times$

### 3. Find the sum of digits of a number

✓  
 $154 \Rightarrow 1+5+4 \Rightarrow 10$   
 $12345 \Rightarrow 1+2+3+4+5 \Rightarrow 15 //$

%	/	num	%	/	sum
		12345	5	1234	1st sum $\Rightarrow 5$
		1234	4	123	9
while		123	3	12	12
		12	2	1	14
		1	1	0	15 $\rightarrow$ print
		0 end			

### Homework: WAP to print product of digits of a given number

num = 12345  
 $1 \times 2 \times 3 \times 4 \times 5 = 120$

### 4. WAP to print sum of all even digits of a given number

num = 1234  
 $2 + 4 = 6$

8468  
 $8 + 4 + 6 + 8$

134  
 4

135 = 0

last 7

$\%2 = 0$  ✓

sum =

### 5. WAP to print reverse of a given number

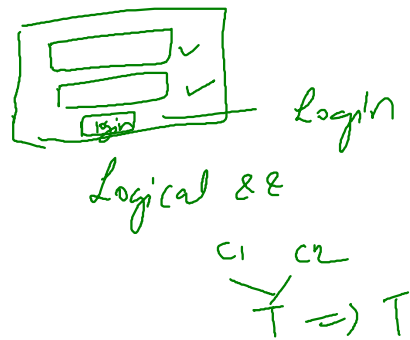
(palindrome)

## 6. Create login system (with password check)

```

string user = "Admin", pass = "1234", lu, lp
if (user == lu && pass == lp) {
    cout << " —————"
} else {
    // —————
}

```



## 7. Write program to simulate traffic light colors

③ Red → 1 (stop)  
 Yellow → 2 (Ready)  
 Green → 3 (Go)  
 4 (Invalid color number)

switch ✓

## 8. Use of break and continue with loop conditions

out ⇒ 1 2 4 ⇒ n = 5  
 ⇒ 1 2 4 n = 6

i = 3 → continue  
 i = 5 → break

## 9. Check armstrong number

← (1, 1, 1) ⇒ Homework //

origin num = 153

1 + 125 + 27 ⇒ 153

153 ⇒ 2 \* 2 \* 2

153 ⇒ pow

num = num / 10 ;

1 2 1  
 1 + 8 + 1 = 10 ✗

10. Use ternary operator to find minimum and maximum of three numbers.

$$a = 5, b = 6, c = 10$$

condition: True : False

if (a > b) {

if (a > c) {

count < a;

} count < c;

} else {

if (b > c) {

count < b;  
else count < c;

}

int min = (a > b) ?

(a > c) ? a : c;

: (b > c) ? b : c;

11. Count number of digits

$$n = 123 = 3$$

$$n = 80467 \Rightarrow 5$$

while (n != 0) {

n = n / 10;

count++

}

count < count  $\rightarrow 5$

8046

you, 80, 8, 0, .

$\Rightarrow$  1

2

3

4

5

12. Print Factorial of a given number

$$3! \Rightarrow 3 \times 2 \times 1 \Rightarrow 6$$

$$5! \Rightarrow 5 \times 4 \times 3 \times 2 \times 1 \Rightarrow 120 \Rightarrow 1 \times 2 \times 3 \times 4 \times 5$$

;

$$n! \Rightarrow n \times (n-1) \times (n-2) \times \dots \times 3 \times 2 \times 1$$

$$\Rightarrow \text{or } 1 \times 2 \times 3 \dots (n-2) \times (n-1) \times n$$

```

n = 5, product = 1 => 120
for (i = 1; i <= n) {
    product = product * i;
}

```

```

n = 5
1 1 2 3 4 5
  ↓ ↓ ↓
p = 1 2 6 24 120
    ↳ olp.

```

Homework: Print the factorial of first n elements

```

n = 4      , n = 5
4!          5!
3!          4!
2!          3!
1!          2!
            1!

```

Hint: nested loops (control 5).  
 $\begin{matrix} \downarrow \\ * \end{matrix}$

13. WAP to print all the ASCII values and their equivalent characters of 26 alphabets

65 - 90 (uppercase capital letter (A-Z))  
 97 - 122 (lowercase (a-z))

65 → A  
 66 → B  
 ⋮  
 90 → Z

97 → a  
 98 → b  
 ⋮  
 122 → z

```

for (char A = 'A'; A <= 'Z'; A++)
{
    int(ch)
}

```

Homework: Check whether number is prime or not

$\begin{cases} \textcircled{1} & 2 & 3 & 4 \\ \text{no} & \times & \times & \times \end{cases}$ 
 $\textcircled{5}$   
 $5 \times 1 = 5$   
 $\nexists \Rightarrow$  not prime.