1-Find power of number using functions

$2^4 \Rightarrow 2 \times 2 \times 2 \times 2 \Rightarrow 16$

library <cmath> → pow(2, 4)) => 16

base = 2
exponent = 4
} user parameter

result = 2 × 2 × 2 × 2

i=1
i=2
i=3
i=4

result = 1

(i=1; i<=exp; i++)

result = result * base;

2-Check whether number is prime or not

1 2 3 4 5 ⇒ 5 is prime

2 (1,2)
3 (1,3)

(1) ✗ (1) ✗

2 +ve

1 2 3 4 5 — 10 not prime numbers

0 1
-ve
}

true

(1) (num<=1) return false →

for(int i = 2; i<=num; i++){

(num%i == 0){

return false

return true;

5%2 = 1 ✗
5%3 = 2 ✗
5%4 = 1 ✗
5%5 == 0 ✓

num/2 => 6/2 => 3

(2, 3, 4, 5)

5
2, 3, 4, 5

4
4%2 == 0 ✓

6 2, 3

8
8/2 = 4 2 3 4 5 6 7
✓ ✗ ✓ ✗ ✗ ✗
2, 3, 4

$i = \frac{num}{2}$ $\quad \frac{num}{2} = \frac{5}{2} = 2$ (2) 5

$i < num$

$\frac{num}{2} = \frac{7}{2} = 3$ (2,3) 7

→ Least Common Multiple

3-GCD and LCM Using Normal Functions

↳ Greatest Common Divisor

GCD of 12 & 18

Factors of 12 => 1, 2, 3, 4, 6, 12

Factors of 18 => 1, 2, 3, 6, 9, 18

=> 1, 2, 3, 6 => 6.

LCM of 4 & 5

Multiples of 4 => 4, 8, 12, 16, 20, 24, 28, 32, 36, 40

Multiples of 5 => 5, 10, 15, 20, 25, 30, 35, 40

20, 40

↳ 20 = Ans.

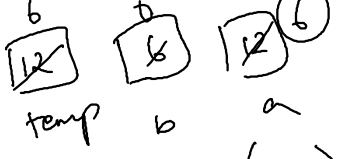
Euclids Algorithm

1) a % b

2) b ki value assign ko a

3) b ko assign remainder

} remainder = 0



6 =>

(18, 12)

↳ 6

```
gcd {
    while(b != 0) {
        temp = b;
        b = a % b;
    }
    a = temp
    return a;
```

lcm { $\frac{a * b}{gcd}$ => $\frac{18 \times 12}{6}$ => 36 //

4- WAP to find Combination

↳ $^nC_r \Rightarrow \frac{n!}{r!(n-r)!}$ } n, r use.

a = $n!$, b = $r!$, c = $(n-r)!$

factorials, n = 5

5! ⇒ 5 × 4 × 3 × 2 × 1 ⇒ 120

4! ⇒ 4 × 3 × 2 × 1 ⇒ 24

n!, r! } (n−r)!

5, 2   3!

a = 5, b = 1, c = 2

1, 2, 3, 4, 5   1, 2   1, 2, 3

$^nC_r = \frac{a}{b*c} = \frac{120}{2 \times 6} \Rightarrow 10$

$^{10}C_5 \Rightarrow \frac{10!}{5!(10-5)!} \Rightarrow \frac{10!}{5! \times 5!}$

$\Rightarrow \frac{10 \times 9 \times 8 \times 7 \times 6 \times 5!}{5! \times 5!}$

$\Rightarrow \frac{30240}{120} \Rightarrow 252$ //

5- WAP to find Permutation

$^nP_r = \frac{n!}{(n-r)!}$

$\Rightarrow \frac{5!}{3!} \Rightarrow \frac{120}{6} \Rightarrow 20$ //

$^5C_3 \Rightarrow \frac{120}{6 \times 2} = 10$

6- Pascal Triangle– Pattern1

n \ r	0	1	2	3	4	5	6	7
0	1							
1	1	1						
2	1	2	1					
3	1	3	3	1				
4	1	4	6	4	1			
5	1	5	10	10	5	1		
6	1	6	15	20	15	6	1	

^nC_r Combination

$^nC_r = \frac{n!}{r!(n-r)!}$

$^3C_2 \Rightarrow \frac{6}{2} \Rightarrow 3$

$\left\{ \frac{n!}{r!(n-r)!} \right.$

$^nC_r = {}^0C_0 \Rightarrow \frac{0!}{0!\,0!} \Rightarrow \frac{1}{1 \times 1} \Rightarrow 1$ //

i = 0, j = 0; i = 1, j = 0, 1; i = 2, j = 0, 1, 2

1) fact → ①

2) ^nC_r → fact(n) / fact(r) × f(n−r) → return.

nested

i=0 i<=n -

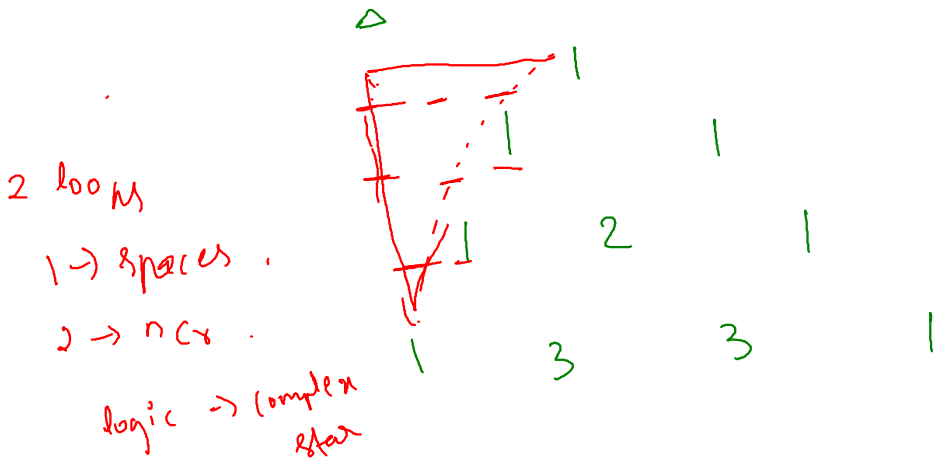
j=0 ; j<=i -

nCr(i,j)

endl;

▷

7- Pascal Pyramid Triangle – Pattern2




```
for(int i=0;i<=n;i++){
    for(int s=0;s<n-i;s++){
        cout<<" ";
    }
    for(int j=0;j<=i;j++){
        cout<<nCr(i,j)<<" ";
    }
    cout<<endl;
}
```

for stars lectures ✓

n=3

i=0

s=0 , s<3

- - - value

i=1

s=0 , s<2

- - value value

i=2

s=0 , s<1

-

i=3

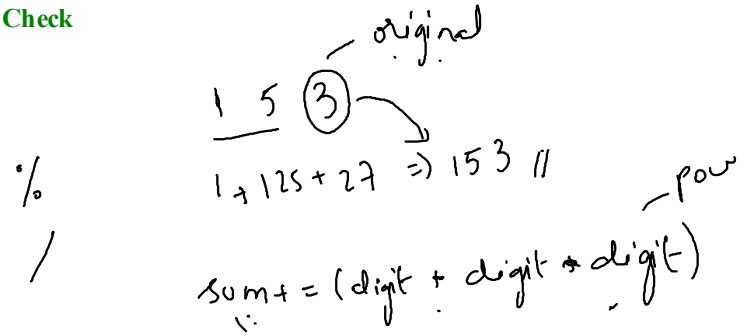
s=0 , s<0

x value

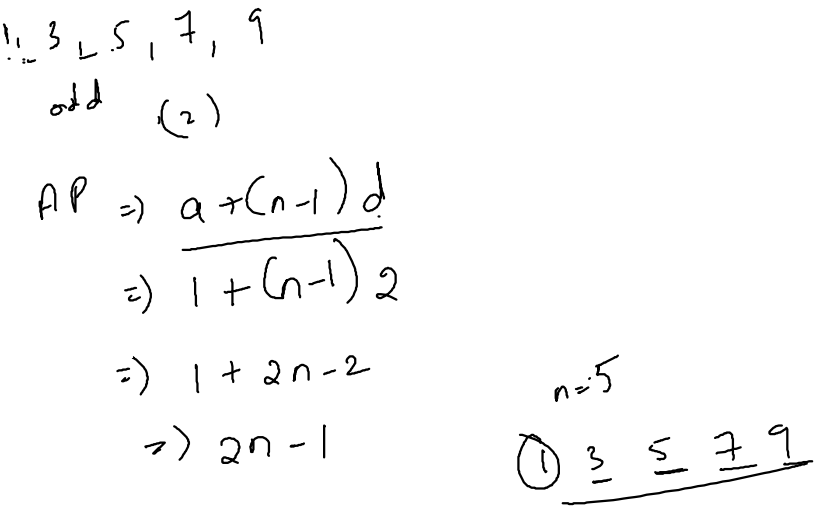
8 -Display numbers from 1 to n in 3 places using functions

9- Reverse and Sum of Digits

10- Armstrong Number Check



11-Arithmetic Progression(AP)



a, d, n

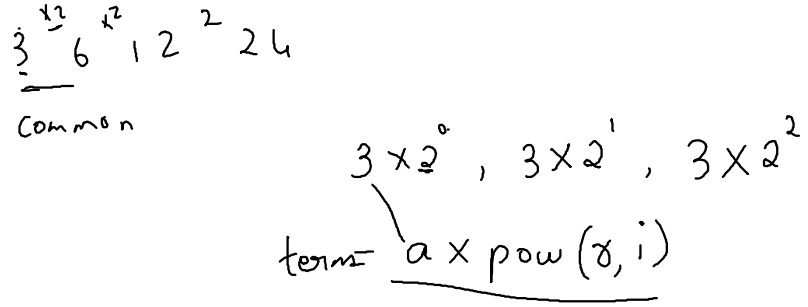
i=1 , i<=5

int term= a+(n-1)d

cout<< term

+ AP

12- Geometric Progression(GP)



13-WAP to find Fibonacci series

0 1 1 2 3 5 8 13 - - ——

H/W -> Control -> using functions
↘ Lecture 13//.

Homework 1-Perfect Number Checker

6 => 1, 2, 3
1+2+3 => 6

12 => 1+2+3+4+6 => 16 ✗

28 => 1 + 2 +4 +7 + 14 => 28 // ✓

Homework 2 - Sum of Digits at Even and Odd Positions

1 2 3 4 5 6

Eve -> 2+4+6 -> 12 ✓
odd -> 1+3+5 => 9 ✓

Homework 3- Count Prime Numbers in a Given Range

<= 10 , end = 20
(10, 20)
11, 13, 17, 19 => (4) => result -

Homework -Find the Strong Number

145 => 1 + 24 + 120 => 145 ✓

123 => 1 + 2 + 6 = 9 ✗