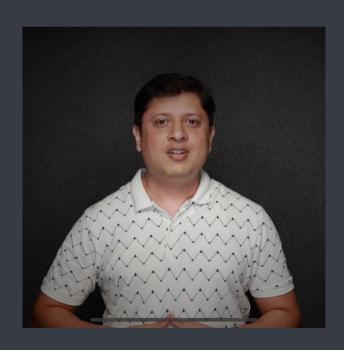# C, C++, DSA in depth

Doubt class assignment-14

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Permutation | Combination

A B C D

Arrange 2 elements out of 4 elements

A B C D

Select 2 elements out of 4 elements

Permutation = all possible arrangements

Combinations = all possible selections

| AB | AC | AD | BC | BD | CD | | AB AC AD |
| BA | CA | DA | CB | DB | DC | | BC BD CD } 6 |

nP_r

$n=4$
$r=2$

$$nP_r = \frac{\lfloor n}{\lfloor n-r}$$

$$= \frac{\lfloor 4}{\lfloor 2}$$

$$= \frac{4 \times 3 \times 2 \times 1}{2 \times 1}$$

$$= 12$$

nC_r $n=4$ $r=2$

$$nC_r = \frac{\lfloor n}{\lfloor r \lfloor n-r}$$

$$4C_2 = \frac{\lfloor 4}{\lfloor 2 \lfloor 2} = \frac{4 \times 3}{2}$$

$$= 6$$

$$36 = 2 \times 2 \times 3 \times 3$$

type modifiers

short
long $\Big\}$

signed $\Big\}$ $\rightarrow$ -ve 0 +ve
unsigned $\Big\}$ $\rightarrow$ 0 +ve

int x;   signed int x;   4 bytes
short int x;   short signed int x;   2 bytes
long int x;   long signed int x;   8 bytes

unsigned int x;   4
unsigned short int x;   2
unsigned long int x;   8

char x;   signed char x;

0 +ve
1 -ve
MSB

unsigned char x;

$= -128 \text{ to } 127$

1 byte

0 111 1111 = 127

1 000 0000 = -128

unsigned char x;

$0 \text{ to } 255$

128 =   1000 0000
         0111 1111 ⟩ 2's
              + 1

-128 = 1000 0000