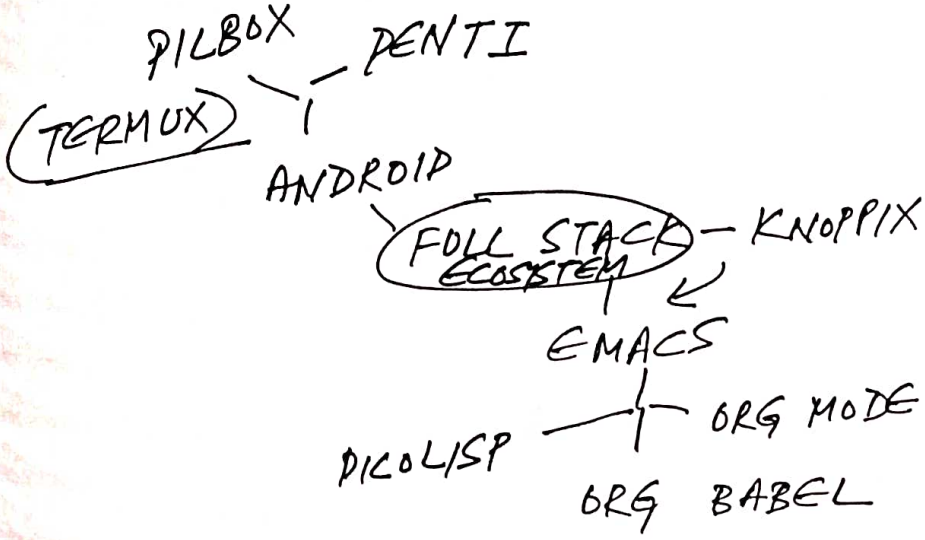
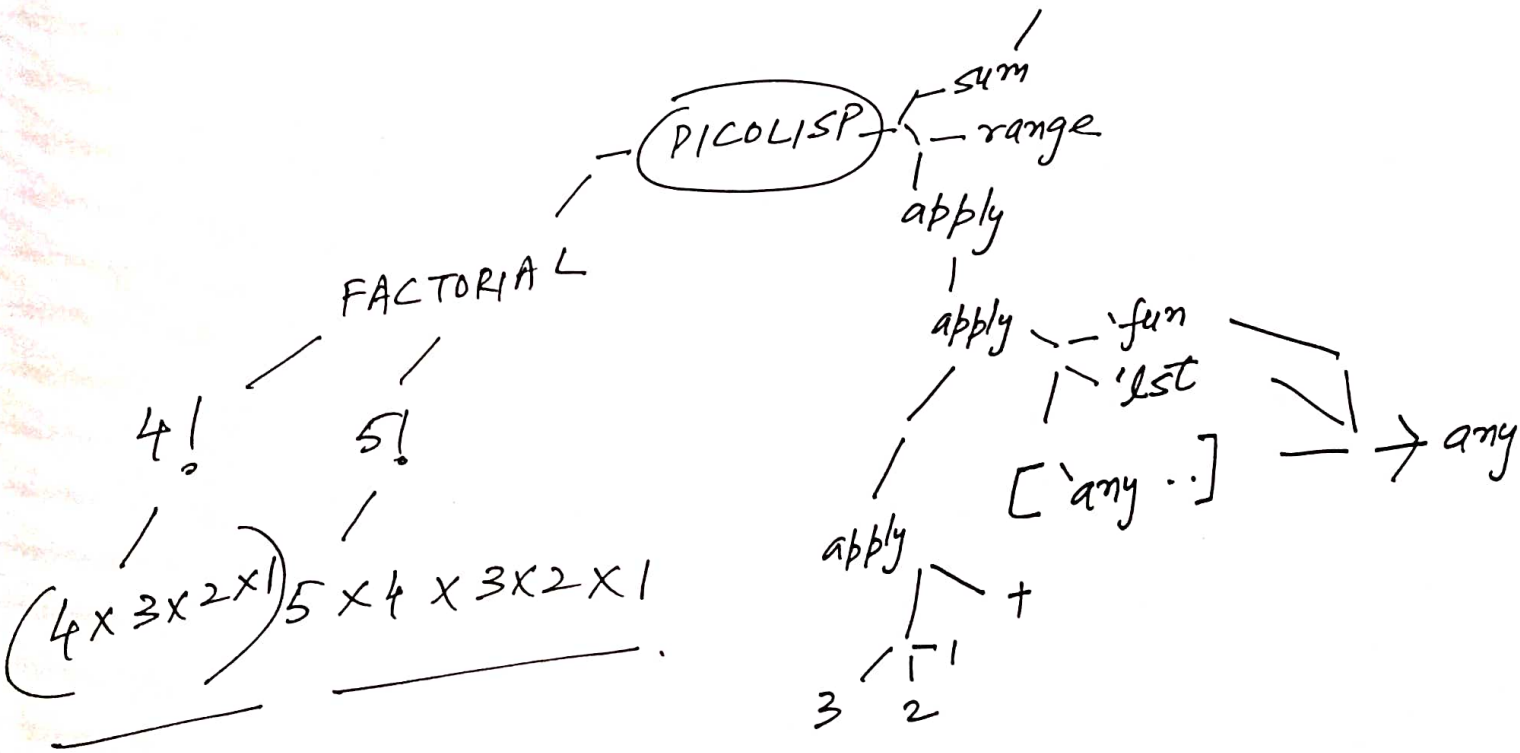
→ ARITHMETIC PROGRESSION SUM
→ FACTORIAL
→ SUM OF NUM FROM 1–100
1–1000 AND SO ON.





Avg. of NUMBERS

Average

Avg. of 2 No. = $\frac{\text{sum of 2 numbers}}{2}$

Avg. of 3 numbers = $\frac{\text{sum of 3 numbers}}{3}$

Avg. of 20 numbers = $\frac{\text{sum of 20 numbers}}{20}$

Avg. of (n) numbers = $\frac{\text{sum of } n \text{ numbers}}{n}$

Avg. of 2 num is = 7 ÷ 2 3.5

3 4

sum of 2 no.s :-

A + B upon — = $\frac{a+b}{2}$

(1+2+3+ . . . . n) → 100, 1000

$\frac{a+b+c}{3}$

(apply + (range 1 n)) / n

1+

a+d

Avg of n numbers.

$\frac{\sum n}{n}$ = A.P. last term = $a+(n-1)d$

a
a+d
a+2d
a+3d
⋮
a+(n−1)d

$\frac{na+d(1+2+3\ldots(n-1))}{n}$

$$na + d((n-1) \ldots + 3 + 2 + 1) \rightarrow \frac{n(n-1)}{2}$$

$$S = (n-1) \ldots + 3 + 2 + 1$$

$$S = 1 + 2 + 3 \ldots (n-1)$$

$$2S$$

$$2S = n + (n-2+2) + \ldots n$$

$$2S = n \times (n-1)$$

$$S = \frac{n(n-1)}{2}$$

$$na + \frac{n(n-1)}{2} \times d$$

$$n\left(a + \frac{(n-1)}{2} d\right)$$

$$n\left(a + \frac{d(n-1)}{2}\right)$$

$1+2$
$1+2+3$
$1+2+3+4$

$S = 1 + 2 + 3 \ldots \ldots (n-1)+n$

$S = n + (n-1) + \ldots$

$2 + 1$

$$S+S = (1+n) + \underbrace{(2+(n-1))}_{1+n} + \ldots + \underbrace{((n-1)+2)}_{n+1} + (n+1)$$

$$2S = n(n+1)$$

$$\boxed{S = \frac{n(n+1)}{2}}$$

$$\boxed{1+2+3+\ldots\ldots+(n-1)+n = \frac{n(n+1)}{2}}$$

Case $n = 10$

$$1+2+3+\ldots+10 = \frac{10(10+1)}{2} = \frac{10(11)}{2}$$

$$= 5 \times 11 = 55$$

Case $n = 100$

$$1+2+3+\ldots+100 = \frac{100(100+1)}{2} = 50 \times (101)$$

$$= 5050$$