

```

Q1) class Parent {
    |   Parent() {
    |       | print ("parent")
    |       }
    }
class Child extends Parent {
    |   Child() {
    |       | print ("Child")
    |       }
    }
}

```

Child c = new Child()

first Parent constructor,
then child constructor

constructor method

Parent
↓
Child

Q2 All primes between A to B
 $1 \leq A \leq B \leq 10^7$

Eg 1 $A = 1$ $B = 5$
ans = 2, 3, 5

$A = 11$ $B = 19$
ans = 11 13 17 19

Idea: How to find primes from 1 to B ?
Sieve of eratosthenes

Code

```
bool p[B+1] = {True}
p[0] = p[1] = false
for (i=2; i ≤ n; i++) {
    if (p[i] == true) {
        for (j=2i; j ≤ n; j+=i) {
            p[j] = false
        }
    }
}
```

$B \log \log B$

```
for (i=A; i ≤ B; i++) {
    if (p[i] == true)
        print(i)
}
```

$B - A + 1$
 $O(B)$

\Rightarrow TC: $B \log \log B$

Q3 $A^B \div C$
 $(345678)^{1234} \div 71$

$A \Rightarrow -10^9 \text{ to } 10^9$
 $B \Rightarrow 0 \text{ to } 10^9$
 $C \Rightarrow 1 \text{ to } 10^9$

Ideas \Rightarrow if B is even

$$(-x)^B = x^B$$

if B is odd
 $(-12)^7 = -1 \times 12^7$
 $(-x)^B \Rightarrow -1 \times x^B$

$$(-x)^B \div C \Rightarrow (-1 \times x^B) \div C$$

$$(a \times b) \div C = [a \div C \times b \div C] \div C$$

$$[-1 \div C \times x^B \div C] \div C$$

$$\begin{aligned} -1 \div C \\ = (C-1) \end{aligned}$$

$$[0, C-1]$$

-1	C-1
0	0
1	1
2	2
3	3
4	4
⋮	
C-1	C-1

$$N = \text{quotient} \times \text{divisor} + \text{remainder}$$

$$N - \text{remainder} = \text{quotient} \times \text{divisor}$$

C	0
C+1	1
C+2	2
⋮	⋮
2C-1	C-1
2C	0
⋮	⋮
	C-1

-C -C-1 - - - - - -2 -1 0 1 2 - -

-40%7	-	40%7	} C++ Java JS
	-	5	

$$-40 \% 7 = 2$$

int solve (a , b , c) {

if (a > 0)

return pow (a , b , c)

if (b % 2 == 0)

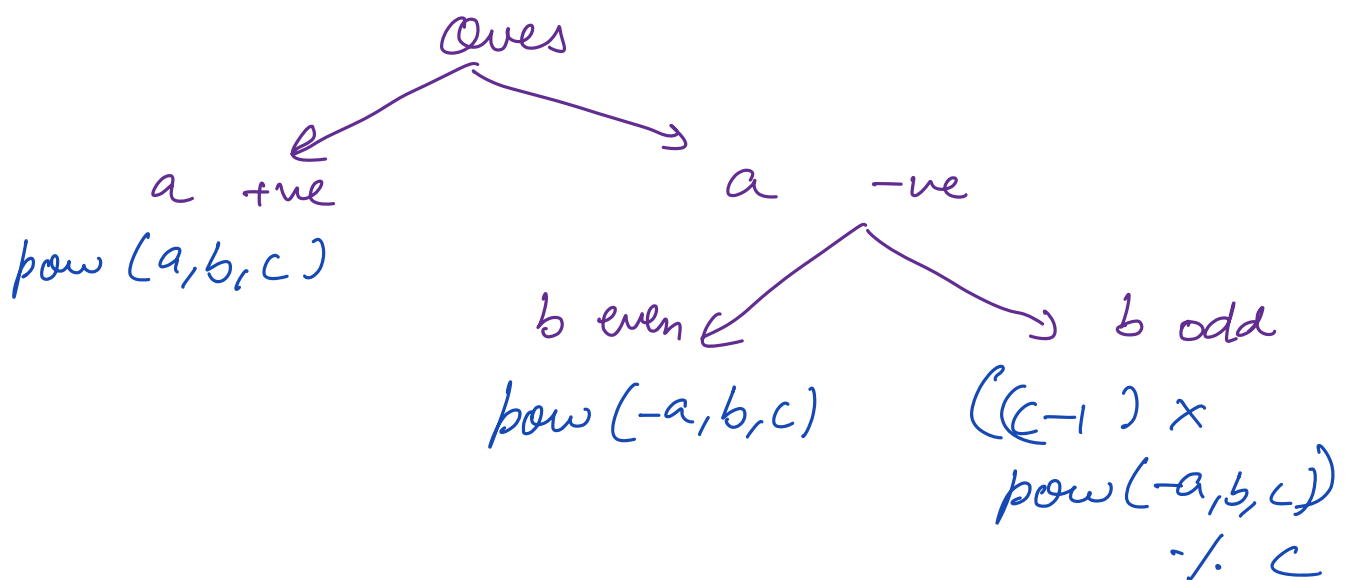
return pow (-a , b , c)

$-1 \times (-a)^{b \div 2} \div c$

$\Rightarrow (-1 \div c) \times (-a)^{b \div 2} \div c$

return [(log) (c-1) x pow (-a, b, c)] $\div c$

}



$$(-x)^3 \div c$$

$$(-x)^3 \div c = (-1 \times x^3) \div c$$

$$(-1 \div c \times x^3 \div c) \div c$$

$$0^0 \div 1$$

$$\div 1 = 0$$

$$-40 \div 2$$

$$-5$$

$$2$$

(long) (Math.pow(A/C, B)) $\div c$

x^y

A = 12345678

C = 12345679

B = 8888888

power(a, b, c) $a^b \div c$