Lec-5

06/06/25 12:40 PM

~~for -> check~~

2 to 14

15 → 3 → x, 5

```
public static void main(String[] args) {
        // TODO Auto-generated method stub
        int n = 7;
        int fact=0;
        for (int i = 2; i < n; i++) {
            if(n%i==0) {
                fact++;
            }
        }
        if(fact>=1) {
            System.out.println("Not prime");
        }
        else {
            System.out.println("Prime");
        }

    }
```

i=1   i<=N   i++

```
public static void main(String[] args) {
        // TODO Auto-generated method stub
        int n = 7;
        for (int i = 1; i <= n; i++) {
            if(i==3) {
                continue;
            }
            System.out.println(i);
        }
    }
```

1<=7
2<=7
3<=7
4<=7
5<=7
6<=7
7<=7
8<=7

1
2
4
5
6
7

0 1 1 2 3 5 8 13 21 34 55 89 144 - - -

0 1 2 3 4 5 6 7 8 9 10 11

$F_n = F_{n-1} + F_{n-2}$

1 to = 1

21
34

N=5

0 1 1 2 3 5 8 13 21 34 55 89 144 - - -

a b

① int c=a+b
0+1=1
a=b
b=c

② c=a+b
1+1=2
a=b
b=c

③ c=a+b
a=b
b=c

④ c=a+b =5
a=b
b=c

⑤ c=a+b =8
a=b → 5
b=c → 8

for(i=1 i<=n i++){
→ int c=a+b
a=b
b=c
}
S.o (a)

60, 36 → H.C.F
G.C.D

36 → 36
36 → 6

36 = 1, 2, 3, 4, 6, 9, 12, 18, 36

60 = 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60

[1, 2, 3, 4, 6, 12] → H.C.F
G.C.D

dividend

divisor ← 36) 60
36
24) 36 (
24
12) 24 (
24
0

H.C.F
G.C.D

28) 60 (1
36
24

36) 60
36
24) 36 (
24
12) 24 (
24
0

dividend = ~~60~~ ~~36~~ 24
divisor = ~~36~~ ~~24~~ 12

while(dividend % divisor != 0) {
int rem = dividend % divisor
→ dividend = divisor
divisor = rem
}
S.o (divisor)

```
public static void main(String[] args) {
        // TODO Auto-generated method stub
        int dividend = 36;
        int divisor = 60;
        while (dividend % divisor != 0) {
            int rem = dividend % divisor;
            dividend=divisor;
            divisor=rem;
        }
        System.out.println(divisor);

    }
```

rem

rem = 36 % 60

60) 36
%60
36) 60 (

1 step

$a \times b = G.C.D(a,b) \times L.C.M(a,b)$

$L.C.M(a,b) = \frac{a \times b}{G.C.D(a,b)}$

234/10 =

2347 → 2+3+4+7

7+4+3+2

N = 2347
234
23 % 10
23/10 = 2
2 % 10 = 2
2/10 = 0

while(n>0) {
rem = n % 10
sum = sum + rem
n = n/10
}
S.o (sum)

36 % 60 = 6

2347
~~n=2~~
rem = 2347 % 10 = 7
n = 2347/10 = 234
rem = 234 % 10 = 4
n = n/10 = 23
rem = n % 10 = 3
n = 23/10 = 2
rem = 2 % 10 = 2
n = 2/10 = 0

Sum = 0+7 = 7+4
= 11+3
= 14+2
= 16

N = 2347
N = 234
N = 23
N = 2
n = 0

rev = 7
7×10+4
= 74×10+3
= 743×10+2
= 7432

while(n>0) {
rem = n % 10
rev = rev × 10 + rem
n = n/10
}
S.o (rev)

3762 8 = 37628

3762×10+8 = 37620+8
= 37628

7×10+4 = 74

prime factor

2	378
3	189
3	63
3	21
7	7
	1

189 % 2 =

2, 3, 3, 3, 7

2

2	378
3	189
3	63
3	21
7	7
	1

i = ~~2~~ ~~3~~
4 5 6 7

loop (N>1) {
if(n % i == 0) {
sysoc(i)
n = n/i
}
else {
i++
}

3

5

$5C_3$

$^{100}C_2$

1
11
121
1331
14641
15101051

$NC_R \to 5C_3$

$NC_R = \frac{N!}{(N-R)! \times R!} = 5C_3$

$5! = 5 \times 4 \times 3 \times 2 \times 1$

4!

$5! = 5 \times 4!$

$N! = N \times (N-1)!$

$5C_3 = \frac{5!}{2! \times 3!} =$

$\frac{5!}{(5-3)!\,3!}$

$= \frac{5!}{2! \times 3!}$

$= \frac{5 \times 4 \times 3!}{2 \times 1 \times 3!}$

= 10

~~ABCDE~~

ABC
ACD
BCD → BCD

0! = 1   1! = 1

$\frac{0!}{(0-0)! \times 0!}$

0 ← 1 → $0C_0$
1 ← 1 1 → $1C_0$ $1C_1$
2 ← 1 2 1
$2C_0$ $2C_1$ $2C_2$
3 ← 1 3 3 1
$3C_0$ $3C_1$ $3C_2$ $3C_3$
4 ← 1 4 6 4 1
$4C_0$ $4C_1$ $4C_2$ $4C_3$ $4C_4$
5 ← 1 5 10 10 5 1
$5C_0$ $5C_1$ $5C_2$ $5C_3$ $5C_4$ $5C_5$

nC_R → nC_{R+1}

$2C_1 = \frac{2!}{(2-1)! \times 1!}$
$= \frac{2!}{1 \times 1} = 2$

67% 8 10th
63% 6 12th
8.58 → CP

$\frac{Row!}{(Row-i)!\, i!}$

nC_R

0 to n

$nC_R = \frac{N!}{(n-R)!\; R!}$

① $NC_R = \frac{N!}{(N-R)!\, R!}$ —①

$NC_{R+1} = \frac{N!}{(N-(R+1))!\,(R+1)!}$ —②

$= \frac{N!}{(n-R-1)! \times (R+1)!}$

② ÷ ①

$\frac{NC_{R+1}}{NC_R} = \frac{\cancel{N!}}{(N-R-1)! \times (R+1)!} \times \frac{(N-R) \times R!}{\cancel{N!}}$

$\frac{NC_{R+1}}{NC_R} = \frac{(N-R) \times \cancel{R!}}{(N-R-1)! \times (R+1) \times \cancel{R!}}$

$\frac{NC_{R+1}}{NC_R} = \frac{(N-R) \times \cancel{(n-R-1)!}}{\cancel{(n-R-1)!} \times R+1}$

$\frac{P}{Q} \div \frac{R}{S} = \frac{P}{Q} \times \frac{S}{R}$

$\frac{P}{Q}$

$X! = X(X-1)!$
$5! = 5 \times 4!$
$(R+1)! = (R+1)R!$
$(n-R)! = (n-R) \times (n-R-1)!$
$N! = N \times (N-1)!$
$5! = 5 \times (5-1)!$

$\frac{nC_{R+1}}{nC_R} = \frac{n-R}{R+1}$

$nC_{R+1} = \left(\frac{n-R}{R+1}\right) \times nC_R$

Row → n

1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
1 5 10 10 5 1

$NC_{R+1} = \left(\frac{N-R}{R+1}\right) nC_R$

$nC_{R+1} = \left(\frac{Row-i}{i+1}\right) nC_R$

int nCR = 1