

Number theory

Q

$n = 4$

$\rightarrow \sqrt{3}$
 $\sqrt{2}$
 $\sqrt{8}$
 $\sqrt{9}$

\rightarrow

3 2 8 9

\rightarrow

$$\begin{aligned}
 &3 * 10 + 2 \\
 &= 32 * 10 + 8 \\
 &= 328 * 10 + 9 \\
 &= 3289
 \end{aligned}$$

$\sqrt{3}$
 $\sqrt{9}$
 $\sqrt{6}$
 7

```
import java.io.*;
import java.util.*;
```

```
public class Solution {
```

```

    public static void main(String[] args) {
        Scanner scn = new Scanner(System.in);
        int n = scn.nextInt();
        int ans = 0;
        for(int i=1; i<=n; i++){
            int digit = scn.nextInt();
            ans = ans * 10 + digit;
        }
    }

```

$n = 4$

ans = 0

3967

~~digit = 3~~ | 967
~~i = 1~~ | 3 4 5
~~ans = 0~~ | 3960 + 7
~~n = 4~~ | = 3967

```
    System.out.println(ans);
```

```
    /* Enter your code here. Read input from STDIN. Print output to STDOUT. Your class
```

$\sum =$

$n = 4$

3
8
3
7 \Rightarrow

3 6 3 7 ✓
⇓
7 3 6 3 ✓

```
public static void main(String[] args) {  
    Scanner scn = new Scanner(System.in);  
    int n = scn.nextInt();  
    int ono = 0;  
    while(n > 0){  
        int a = scn.nextInt();  
        ono = ono * 10 + a;  
        n--;  
    }
```

$4 \times 2 + 0$
 $ono = 0 \times 10 + 3$
 $ono = 3 \times 10 + 6$
 $ono = 36 \times 10 + 3$
 $ono = 363$

$36 \times 10 = 360$

\rightarrow System.out.println(ono);

int rev = 0;

```
while(ono > 0){  
    int rem = ono % 10;  
    rev = rev * 10 + rem;  
    ono = ono / 10;  
}
```

\rightarrow System.out.println(rev);

/* Enter your code here. Read input from STDIN. Print output to STDOUT. Your

9 \rightarrow 3
8 \rightarrow 6 ✓
3 \rightarrow 9
7 \rightarrow 8

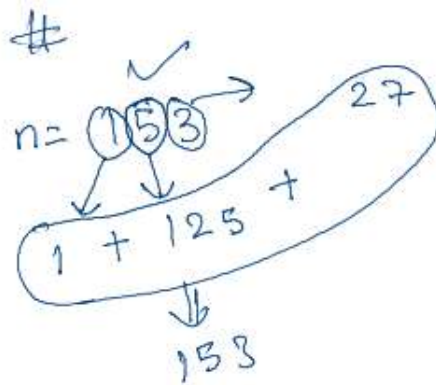
3 6 9 8

8 9 6 3

rev = 8 9 6 3

rem = 8 9 6 3

Q Armstrong #



$3 \times 3 \times 3$

$(a^3) \Rightarrow \text{cube of } a$

$$\begin{matrix} \text{153} \\ abc \end{matrix} \Rightarrow \left(\overset{3}{\underset{abc}{a^3}} + \overset{3}{\underset{abc}{b^3}} + \overset{3}{\underset{abc}{c^3}} \right) = 1 + 125 + 27 = \text{153}$$

Armstrong #

```
public class Solution {
    public static void main(String[] args) {
        Scanner scn = new Scanner(System.in);
        ✓ int t = scn.nextInt();

        while(t > 0){
            int n = scn.nextInt(); ✓
            boolean ans = Armstrong(n); ✓
            ✓ System.out.println(ans);
            t--;
        }
        /* Enter your code here. Read input from STDIN. Print output to STDOUT.
    }

    public static boolean Armstrong(int n){
        int temp = n; ✓
        ✓ int val = 0;

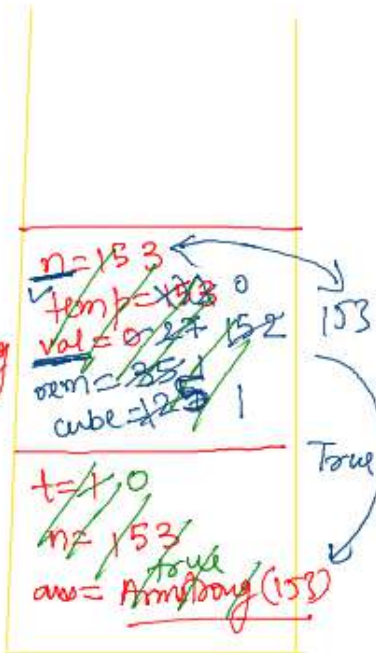
        while(temp > 0){
            int rem = temp % 10; ✓
            int cube = rem * rem * rem; ✓
            val = val + cube; ✓
            temp = temp / 10;
        }

        ✓ return val == n;
    }
}
```

True

Armstrong

main



Q Rotate a digit



3 digit

$$\begin{aligned} 459 &\leftarrow \text{last 3 digit} = n \% 1000; \\ n &= n / 1000; \quad 8632 \end{aligned}$$

$$\begin{aligned} &[4598632] \\ &\begin{array}{r} 4590000 \\ 8632 \\ \hline 4598632 \end{array} \end{aligned}$$

$$4590000 + 8632$$

```
public static void main(String[] args) {
    Scanner scn = new Scanner(System.in);
    int n = scn.nextInt();

    while(n > 0){
        int val = scn.nextInt();

        int last3digits = val % 1000;
        val = val / 1000;
        int temp = val;
        int count = 0;
        while(temp > 0){
            temp /= 10;
            count++;
        }
        int pow = (int) Math.pow(10, count);
        last3digits = last3digits * pow;
        last3digits = last3digits + val;
        System.out.println(last3digits);
        n--;
    }
}
/* Enter your code here. Read input from STDIN. Print output to STDOUT. Your class sh
```

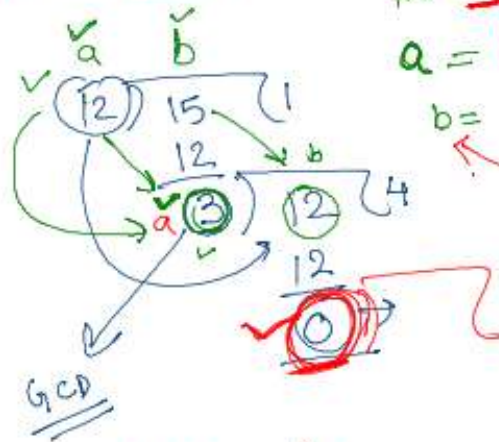
$$\begin{aligned} &\rightarrow 2 \Rightarrow 100 \\ &\text{val} = 76 \\ &\text{last 3 digit} = 3240000 \end{aligned}$$

$$\begin{array}{r} 3240000 \\ 7689 \\ \hline 3247689 \end{array}$$

$$\begin{array}{r} 32400 \\ 76 \\ \hline 32476 \end{array}$$

Q GCD

$a = 12$ $b = 15 \rightarrow \text{HCF}$
 $\text{int temp} = a$
 $a = b \% a$
 $b = \text{temp};$

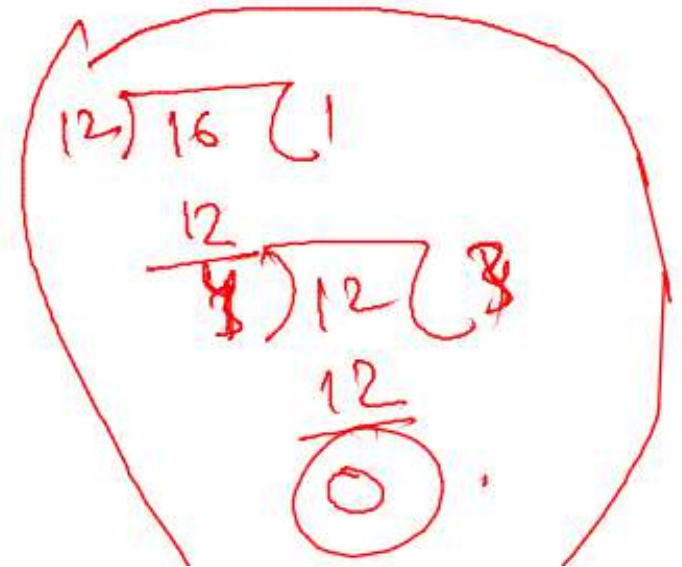
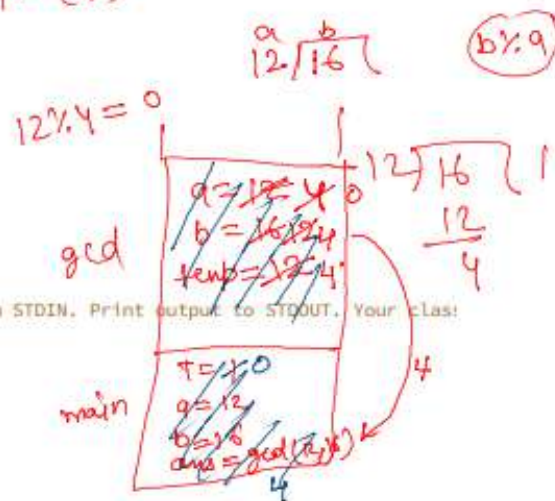



$\text{while}(a \neq 0)$
 $\text{int temp} = a;$
 $a = b \% a;$
 $b = \text{temp};$

$\text{syn}(b)$

```
public static void main(String[] args) {
    Scanner scn = new Scanner(System.in);
    int t = scn.nextInt(); // 1
    while(t > 0){
        int a = scn.nextInt(); // 12
        int b = scn.nextInt(); // 16
        int ans = gcd(a, b);
        System.out.println(ans);
        t--;
    }
    // Enter your code here. Read input from STDIN. Print output to STDOUT. Your class
}
```

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



$a = 10000000$
 $b = 1000000$


```

- for(int i=1; i < a; i++) {
    if (a%i == 0 || b%i == 0) {
        ans = i;
    }
}
sysout(ans)

```

$a = 12$ ✓
 $b = 16$ ✓
 $i = 1$ to 12
 \downarrow
 2
 4

```
public static int gcd(int a , int b){
```

```
int ans = 0;
for(int i=1; i<=a && i<=b; i++){
    if(a%i==0 && b%i==0){
        ans = i;
    }
}
return ans;
```

128

1 = ~~1~~ 2 3 4 5 6 7 8 9 10
 11 12
13

✓ 1 2
1 2

4 4 → return