$(n)_{10} \longrightarrow (\quad)_b$

$(\quad n \quad)_b \longrightarrow (\quad)_{10}$

$(1011101)_2 \longrightarrow (\quad)_{10}$

1 0 1 1 1 0 1 ←

$1\times2^6 + 0\times2^5 + 1\times2^4 + 1\times2^3 + 1\times2^2 + 0\times2^1 + 1\times2^0$

$64 + 0 + 16 + 8 + 4 + 0 + 1$

2
64
16
8
4
1

93

$(162)_8 \rightarrow (114)_{10}$

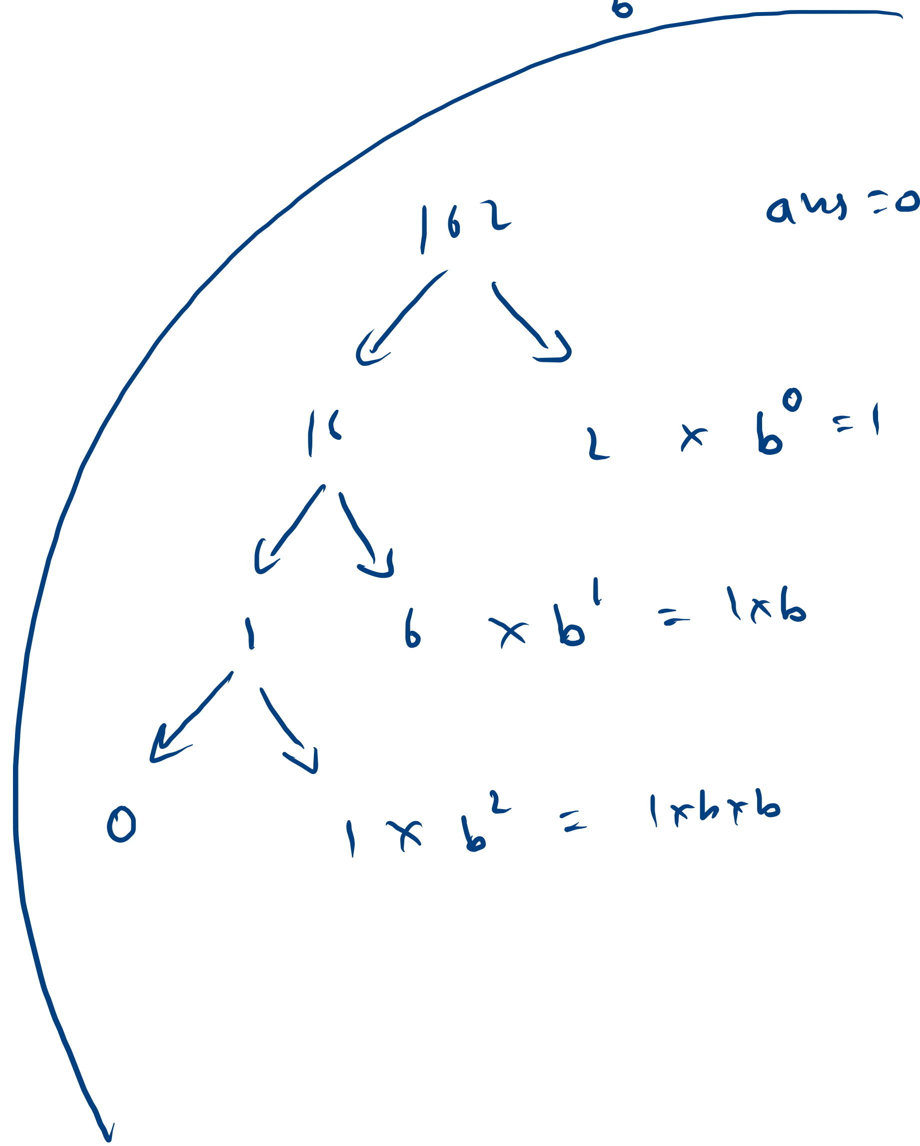
`(int)Math.pow(b, pow);` b^{pow}

$1 \quad 6 \quad 2$

$1 \times 8^2 + 6 \times 8^1 + 2 \times 8^0$

$64 + 48 + 2$

$$\begin{array}{r} 64 \\ 48 \\ 2 \\ \hline 114 \end{array}$$



$(162)_8 \longrightarrow (114)_{10}$

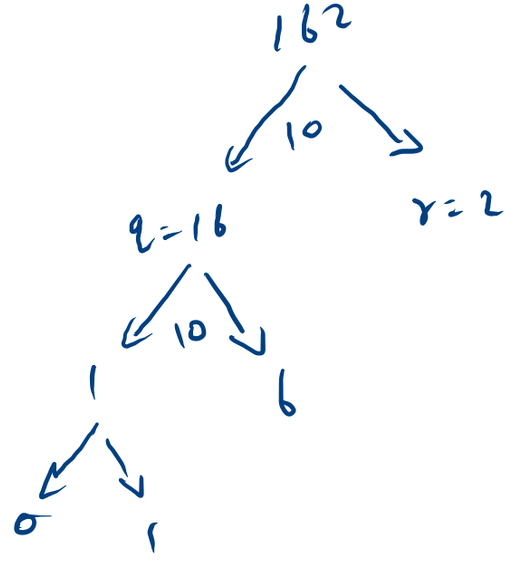
n = 4, b = 8

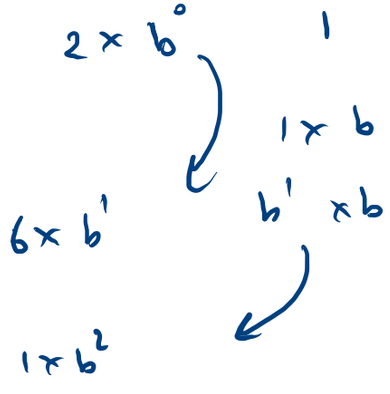
1 6 2

$1\times8^2 + 6\times8^1 + 2\times8^0$

$64 + 48 + 2$

multi = $b^0 = 1$





multi = 1

ans = 0

```
while ( n != 0) {
    q = n/10
    r = n%10

    ans = ans + r x multi

    multi = multi*b

    n = q
}
```

Any Base To Any Base

$(n)_{b1} \longrightarrow (\ ?\ )_{b2}$

n = 111001
b1 = 2
b2 = 3

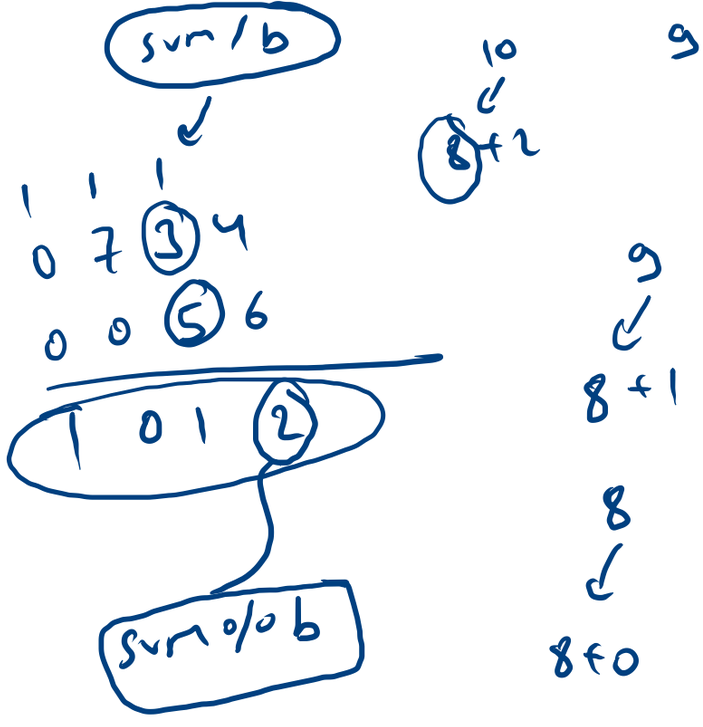
$(111001)_2 \longrightarrow (\ ?\ )_3$

2010

b = 8

n1 = 734

n2 = 56



10 → 8+2

9

9 → 8+1

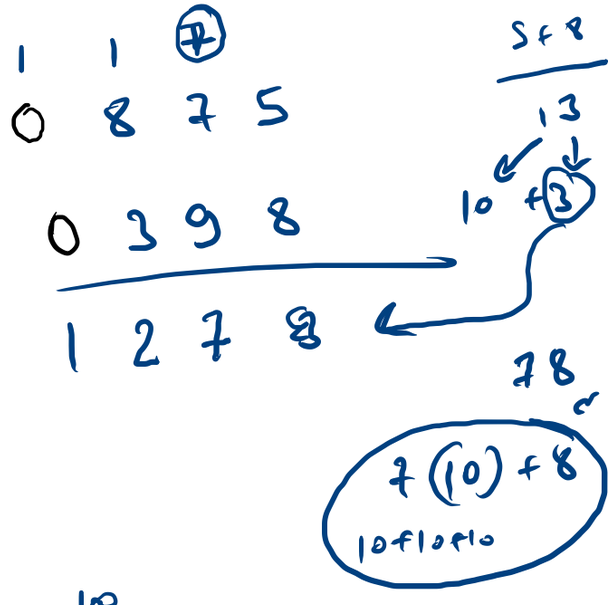
8 → 8+0

n1

n2

sum = n1+n2+carry

b = 10

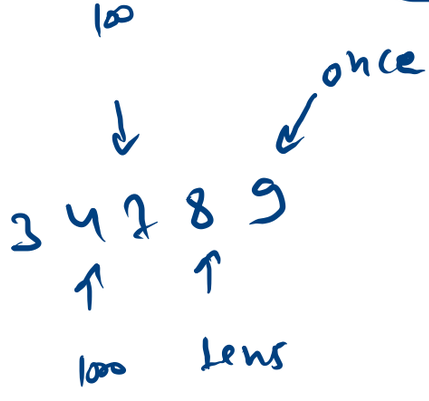


19/8 → 2

19%8 → 3

9/8 → 1

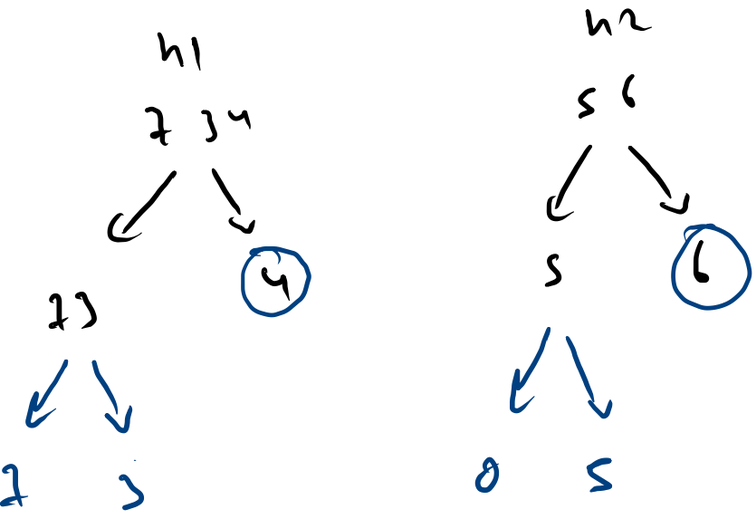
9%8 → 1



b = 8

n1 = 734

n2 = 56




```
    11
   734
    56
  -----
  1012
```

2×10^0
1×10^1
0×10^2
1×10^3

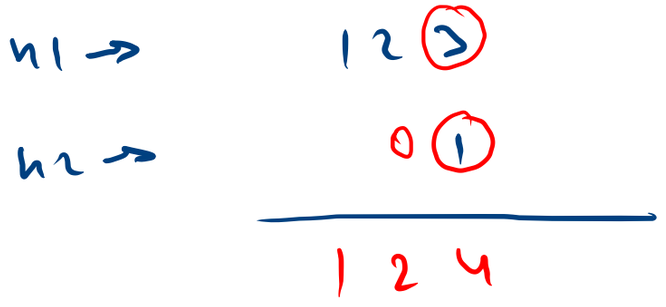
multi

digit = 2 × 10^0

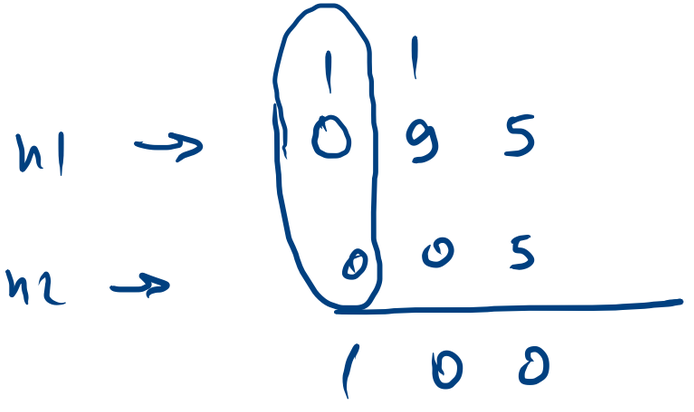
digit = 1 × 10^1

dig = 0 × 10^2

```
ans = 0
carry = 0
multi = 1 // 10^0
while( ggg ) {
    q1 = n1//10
    r1 = n1%10
    q2 = n2//10
    r2 = n2%10

    sum = r1+r2+carry
    digit = sum%b
    carry = sum//b
    ans = ans + digit*multi
    multi = multi*10
    n2 = q2
    n1 = q1
}
```



l1>0 || l2>0 || carry>0



11.5

Any Base Multiplication

b = 10

n1 = 578

n2 = 34

```
  5 7 8   <- n1
  1 3 4   <- n2
-----------
  1 2 3 12   x10^0
  1 7 3 4 0  x10^1
  5 7 8 0 0  x10^2
-----------
  7 6 5 2
```

```
  2 3 3
    5 7 8        2*8+3
        4        31
-----------      2*4+3
  2 3 1 2        23
```

```
  1 2 2
    5 7 8        24
        3        2*4+2
-----------      23
  1 7 3 4        17
```

14

10+4

14+2

16

10+6

```
    5 7 8
        1
-----------
    5 7 8
```

b = 8

n1 = 12 → $(?)_{10}$

n2 = 324 → $(?)_{10}$

12 ← n1
324 ← n2

50 × 10^0
+ 24 × 10^1
+ 36 × 10^2

4110

12 ← n1
324 ← n2

50 ×10^0
240 ×10^1
3600 ×10^2

4110 ←

8
8 | 0

1
12
4

50

pro = multiplywithsingledigit(b, n1, n2)

anybaseaddition(b, ans, proxmulti)

a + b ← decimal

a × b ←

12
× 2

24

12
3

36

1 310
3600

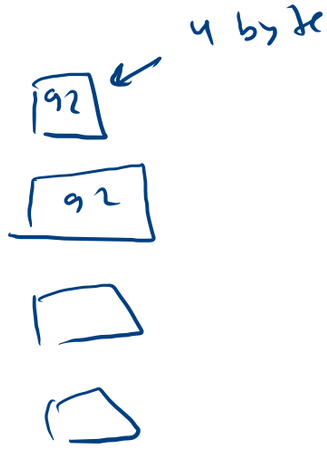
4110

9
8 | 1

mark1 + mark2

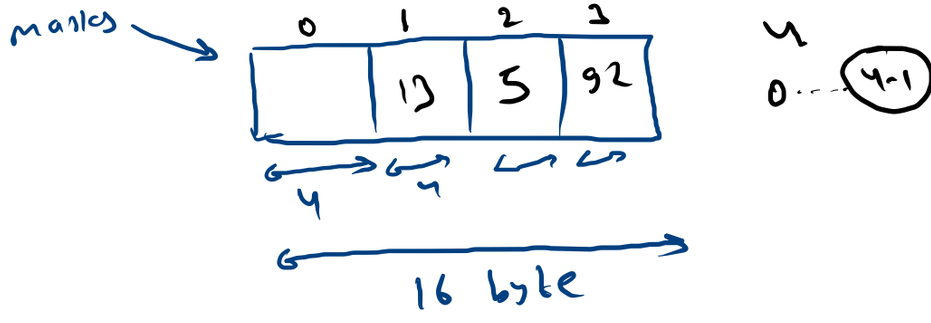
mark1 * 2

```
int mark1 = 92
int mark2 = 92
;
```



mark12

```
int marks[] = new int[ 4 ];
marks[2] = 5
marks[3] = 92
int sum = mark[3] + mark[2]
```



n=4

4
10
15
3
17

// Sca

6 15 30 40 4 11
9

0	1	2	3	4	5
15	30	40	4	11	9

✓ step 1 max, min

Span → max - min

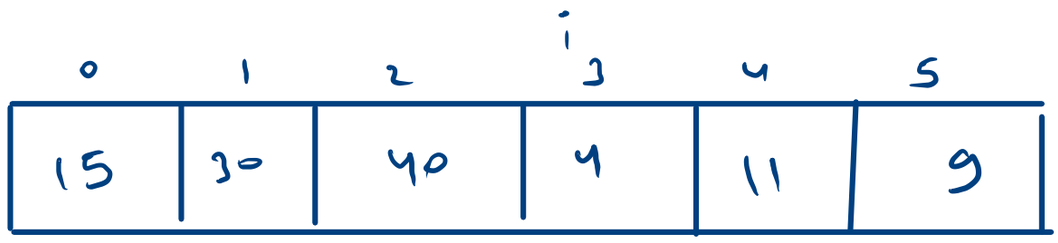
40 - 4

= 36

✓ step 2 → span

step 3 → print

36



max = arr[0]
min = arr[0]

max = ~~15~~ ~~30~~ 40

min = ~~15~~ 4

i ← 1 to n-1

4 > 40

if(arr(i) > max)

max = arr(i)

4 < 15

if(arr(i) < min)

min = arr(i)

32 ← int

32 bit

8 bit → 1 byte

1024 byte → 1 kb

1024 kb → 1 mb

1024 mb → 1 gb

8 Gb → 8x1024 mb

8x1024 x1024 x1024 x8 → bit

int n = 10

int arr[] = new int[4];

arr[0] = 5

arr[1] = 7

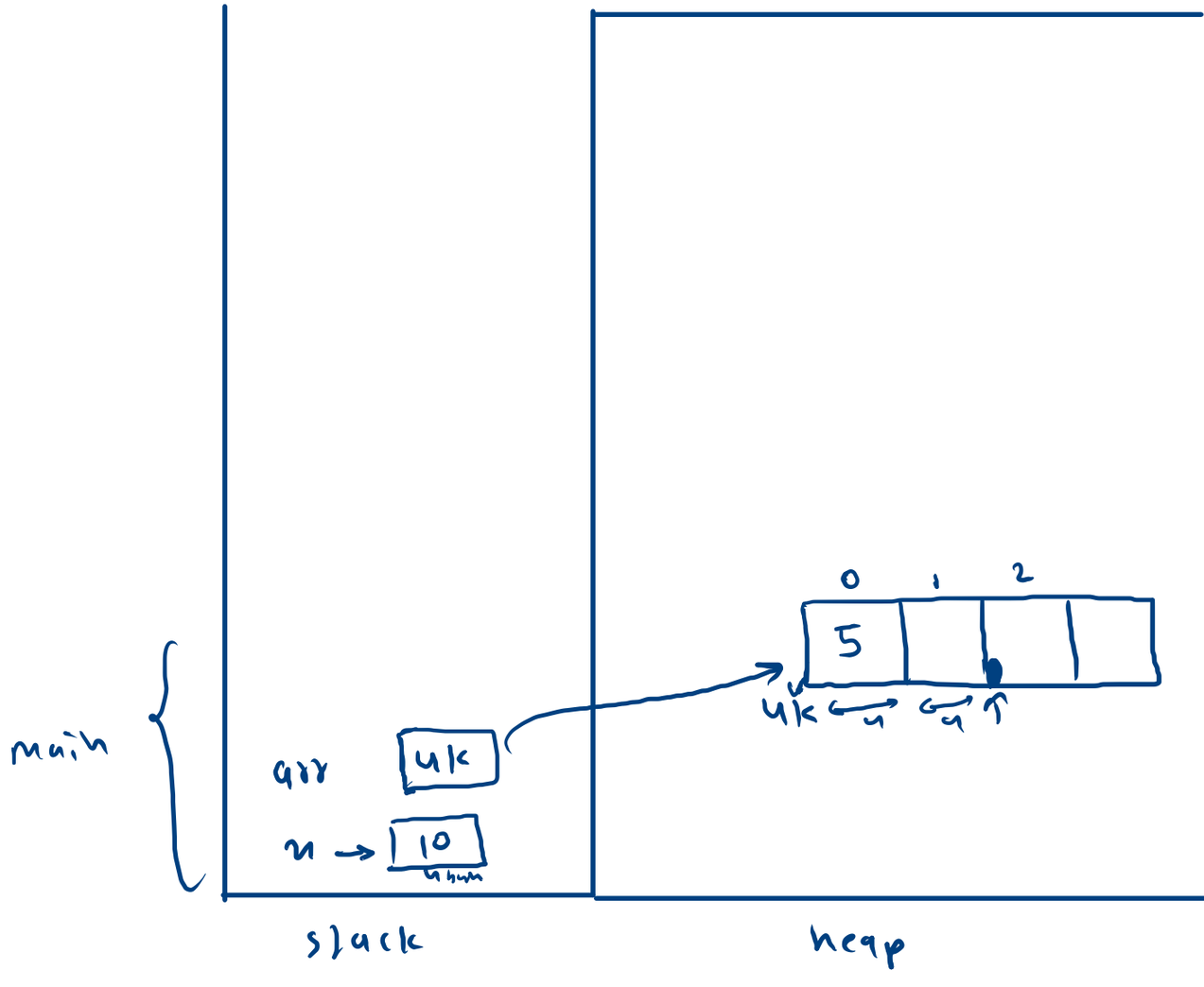
arr[i] = n

4K + i x size

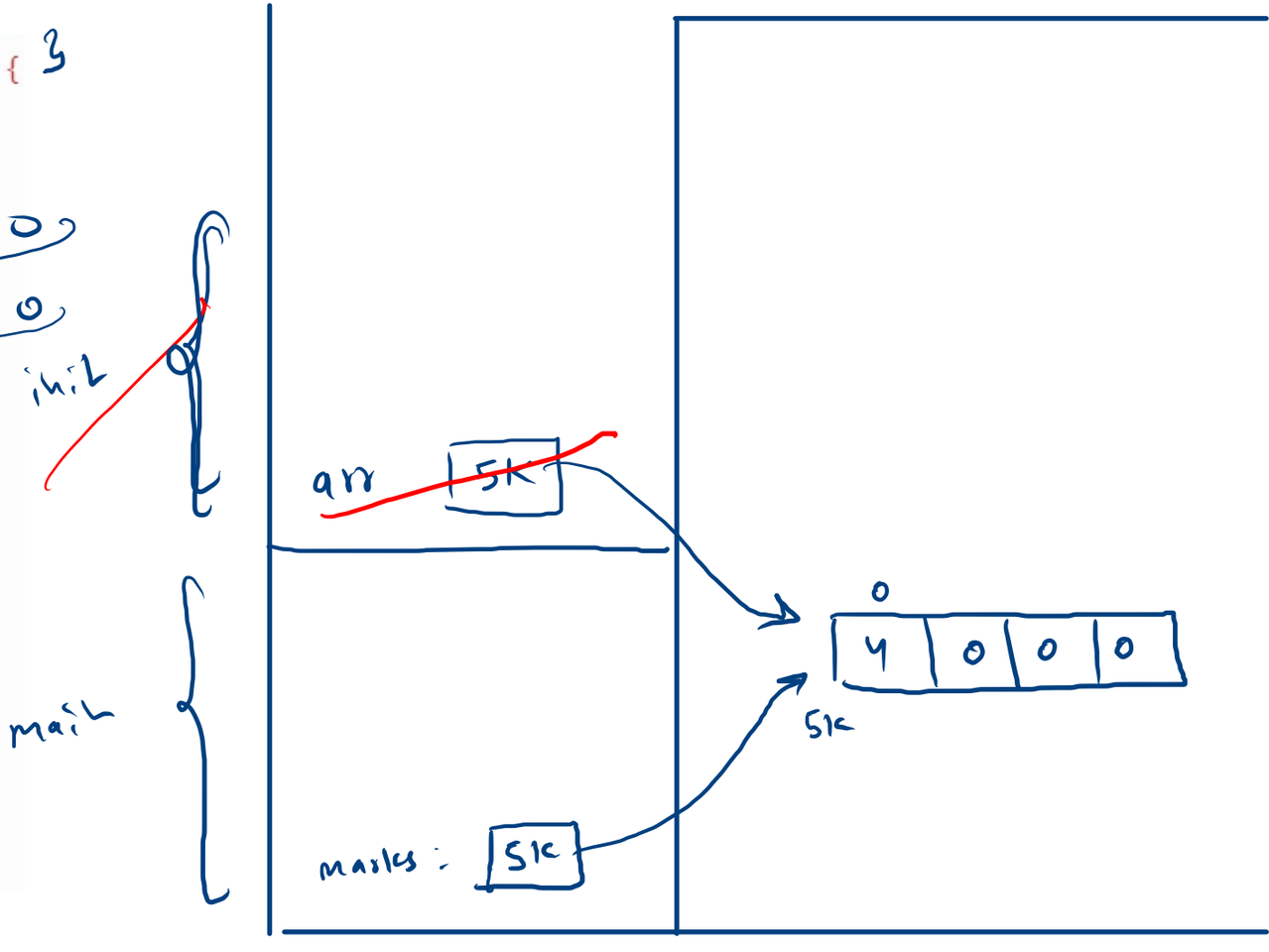
4K + 0 x

4K + 2 x 4

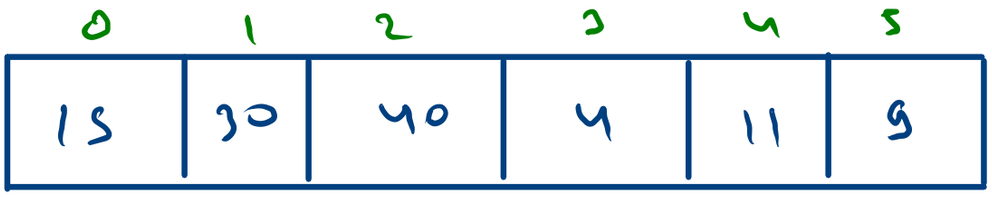
4K + 8



```java
public static void main(String[] args) throws Exception {

    int marks[]; // declaration
    marks = new int[4];// initialization


    for(int i=0;i<marks.length;i++){
        System.out.print(marks[i]+" ");
    }
    System.out.println();

    init(marks);

    for(int i=0;i<marks.length;i++){
        System.out.print(marks[i]+" ");
    }
    System.out.println();

}

public static void init(int arr[]){
    arr[0] = 4;
}
```



$h = 6$

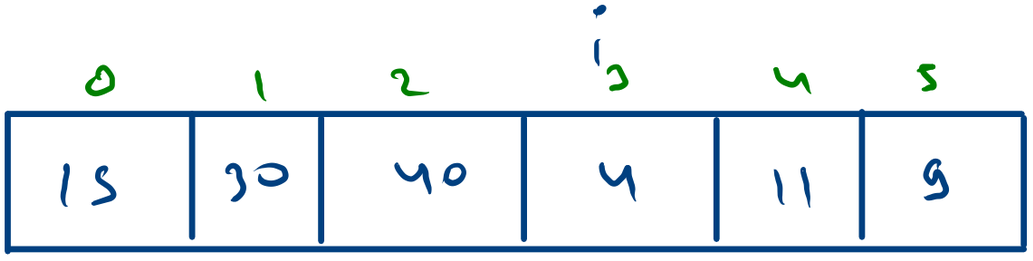


$d = 40 \rightarrow$ 2

$d = 44 \rightarrow$ -1

6 15 30 40 4 11

9 40



index = -1

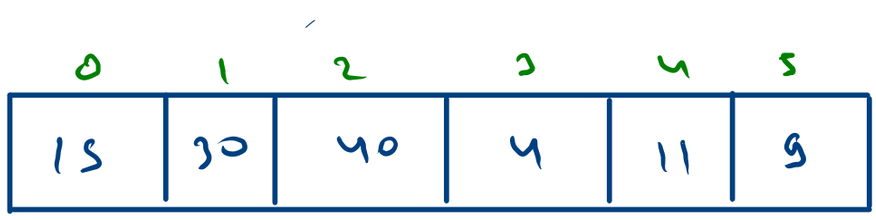
d = 4 → 3

-1

d = 44 →

```
for(int i=0;i<n;i++){
    if(arr[i] == d){
        println(i);   index = i
        break;
    }
}
```

print (-1)




```java
int d = scn.nextInt();

int index = -1;
for(int i=0;i<n;i++){
    if(arr[i] == d){
        index = i;
        break;
    }
}

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

d = 44

index = -1