Today's agenda

- Intro to arrays
- Return sum of arr[] elements.
- Array with functions
- Swap 2 indexes.

// Intro to array

10 numbers

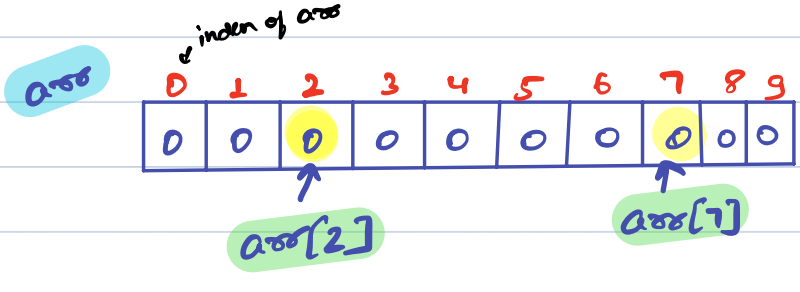
↳ int a1 = sc.nextInt();
int a2 = "
.
.
.
int a10 = "

1000 numbers
↓↓
Array
↓↓
Collection of data types (variables)

Syntax
→ type[] name = new type[size];

Q) Create an array of size 10 which will store integers.

↳ int[] arr = new int[10];



//indexing and Properties

↳ Scanner sch = new Scanner(System.in);

↳ int n = sch.nextInt(); → {5}

int[] arr = new int[n];

arr

0	1	2	3	4
0	0	0	0	0

→
```
for(int i=0; i<=n-1 ; i++){
    arr[i] = sch.nextInt();
}
```
(i<n or i<=n-1)

arr

0	1	2	3	4
~~1~~	~~2~~	~~3~~	~~4~~	~~5~~

i=0 i=1

→ if array is of length N.

1st index = 0

last index = N-1

Q) Create an array of length 5 with values 10 20 30 40 50.

```java
public static void main(String[] args) {
    Scanner scn = new Scanner(System.in);
    int n = scn.nextInt(); // n -> 5

    int[] arr = new int[n]; //arr -> {0, 0, 0, 0, 0}

    for(int i=0;i<n;i++){ // arr -> {10, 20, 30, 40, 50}
        arr[i] = scn.nextInt();
    }

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

    System.out.println(arr.length); // length of array

    // Initialization way 2
    int[] num = {5, 15, 25, 35, 45};
    System.out.println(num.length);

}
```

Q) Sum of array

↳ Read an array of N length and Print the sum of all elements.

Ex: arr[4]: 10 (0) -1 (1) 3 (2) -7 (3) → 5

// Pseudo code

```
void main () {
    Scanner scn = new Scanner(System.in);
    int n = scn.nextInt();
    int[] arr = new int[n];
    for (int i=0; i<n; i++) {
        arr[i] = scn.nextInt();
    }
    int sum=0;
    for (int i=0; i<n; i++) {
        sum = sum + arr[i];
    }
    System.out.println(sum);
}
```

T.C: O(N)

S.C: O(1)

↓

length of array

(you ignore input & output array)

```
int sum = 0;
for (int i=0; i<n; i++) {
    sum = sum + arr[i];
}
System.out.println(sum);
```

n = 4

	0	1	2	3
arr[4]:	10	-1	3	-7

Sum = 0

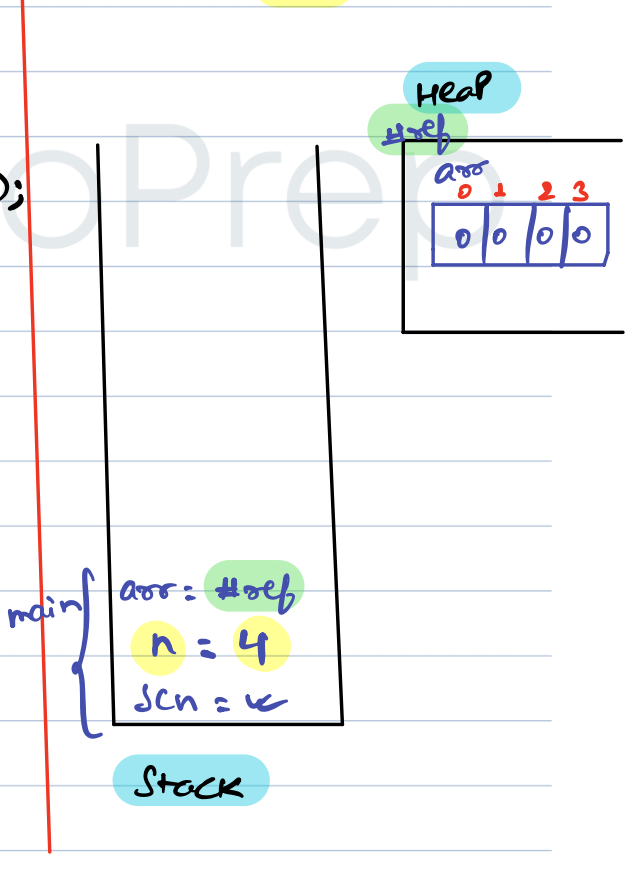
i	i<n	sum
0	t	10
1	t	9
2	t	12
3	t	5
4	f	

↳ exit

Tracing

```
Scanner scn = new Scanner(System.in);
int n = scn.nextInt();
↳ int[] arr = new int[n];

System.out.println(arr[2]);
↳ 0
```



Break till 9:32 PM

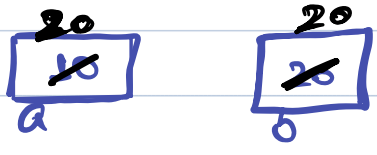
Q) Swap the values of 2 variables.

a = 10 b = 20 ⇝ a = 20 b = 10

// incorrect way

```
void main () {
    int a = 10;
    int b = 20;

    a = b;
    b = a;
}
```



// Correct way

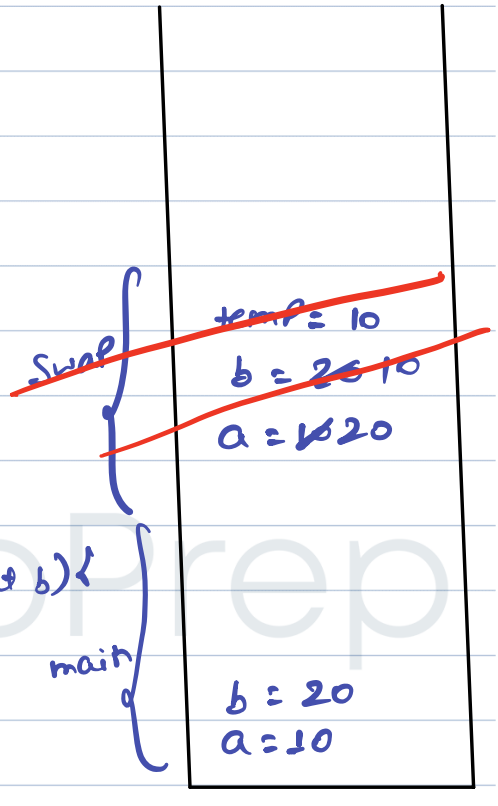
```
void main () {
    int a = 10;
    int b = 20;
    int temp = a;
    a = b;
    b = temp;
}
```

// function game

Quiz

```
main() {
    int a = 10;
    int b = 20;
    swap(a, b);
    System.out.println(a);   → 10
    System.out.println(b);   → 20
}

Public static void swap(int a, int b){
        int temp = a;
        a = b;
        b = temp;
}
```



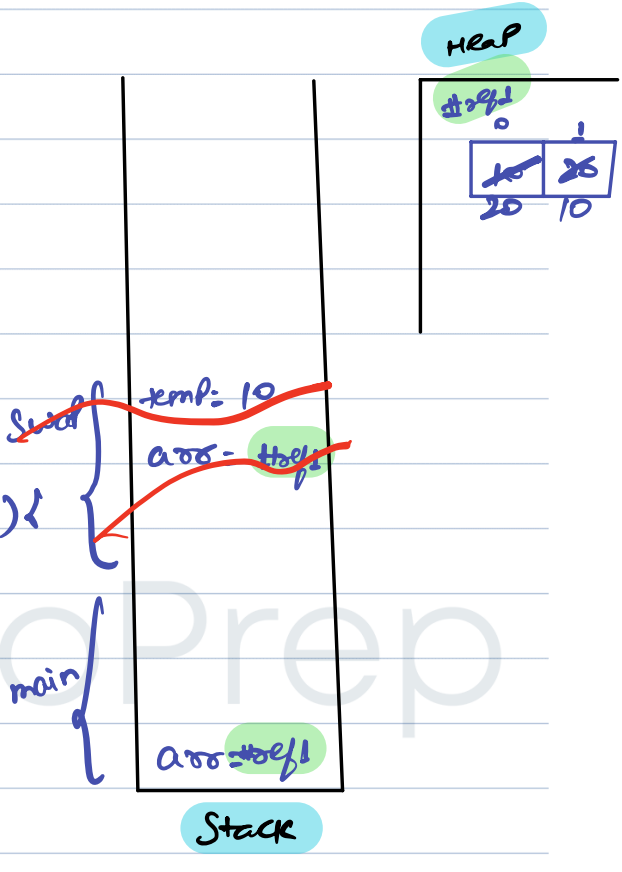
↳ variables of 2 functions are not connected.

Quiz

```
main() {
    int[] arr = {10, 20}
    Swap(arr);
        #ref1

    System.out.println(arr[0]); → 20
    ↳ System.out.println(arr[1]); → 10
}

Public static void Swap( int[] arr ){
    int temp = arr[0];
    arr[0] = arr[1];
    arr[1] = temp;
}
```



Is arrays across functions are always connected.

Q) Swap indexes

Is Given array of length N and two indexes idx1 and idx2, swap the element of those two indexes.

Ex: arr[5] : { 5 ~~15~~ 35 25 ~~35~~ 15 45 }
(indexes: 0 1 2 3 4)

idx1 = 1 idx2 = 3

```
int temp = arr[idx1];
arr[idx1] = arr[idx2];
arr[idx2] = temp;
```