Today's agenda

↳ Intro to arrays

↳ Return Sum of arr[] elements.

↳ Array with functions

↳ Swap 2 indexes.

// Intro to array

input → 10 numbers

int a1 = scn.nextInt();

int a2 =   "

    ;

    ;

    a10 =   "

1000 numbers?
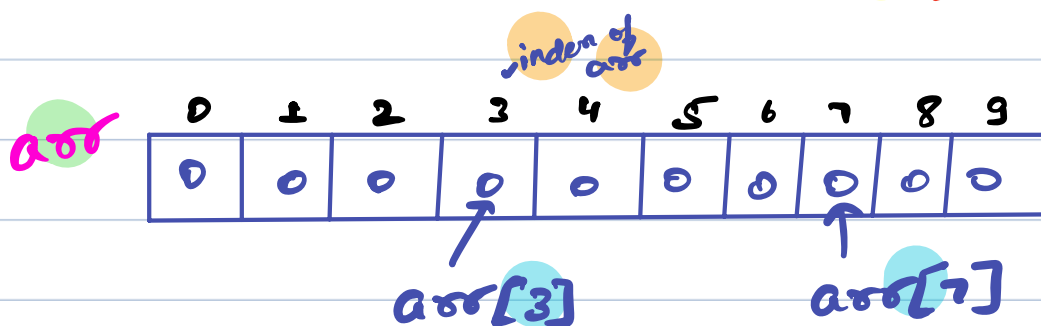   Array
Collection of variables.

Syntax:
    ↳   type [ ] name = new type [size];

            ex: int [ ] arr = new int [1000];

Q) Create an array of size 10 named arr storing
    integers.
        ↳ int [ ] arr = new int [10];

        index of
          arr

arr

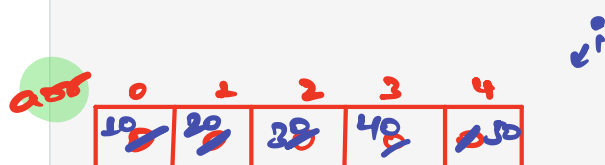| 0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0

            arr[3]   arr[7]

// Input in array

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

n=5

```java
1   // "static void main" must be defined in a public class.
2   public class Main {
3       public static void main(String[] args) {
4           Scanner scn = new Scanner(System.in);
5           int n = scn.nextInt();
6
7           int[] arr = new int[n];
8
9           for(int i = 0; i < n;i++){
10              arr[i] = scn.nextInt();
11          }
12
13      }
14  }
```

arr

0	1	2	3	4
10	20	30	40	50

i

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stdin ▾

5
10 20 30 40 50

→ initialize array on your own.
   int[] arr = {1,2,3,4,5};

→ arr.length = no. of elements in array.

→ if arr is of length n,

   1st index = 0
   last index = n-1

Q) How to Print all the elements of arr.

```java
// "static void main" must be defined in a public class.
public class Main {
    public static void main(String[] args) {
        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();
        }

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


    }
}
```

Output: **Finished**   Clear Console

Finished in 148 ms
1020304050

Finished in 175 ms
10 20 30 40 50

stdin ▾
5
10 20 30 40 50

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Q) Sum of array

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

$$\text{Ex: arr[4]:} \quad \overset{0}{10} \quad \overset{1}{-1} \quad \overset{2}{3} \quad \overset{3}{-7} \rightarrow 5$$

ꞁꞁpsuedo code

```
// "static void main" must be defined in a public class.
public class Main {
    public static void main(String[] args) {
        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: 2N
↳
O(N)

→ O(1)

S.C: $\frac{N}{X+4}$

↓

input & output is not your space

→ System.out.println(sum); → 5

Sum = 0

n = 4

$$\text{arr[4]:} \quad \overset{0}{10} \quad \overset{1}{-1} \quad \overset{2}{3} \quad \overset{3}{-7}$$

i	i < n	Sum
0	t	10
1	t	9
2	t	12
3	t	5
4	f → exit	

How arrays are actually stored?

HEAP

```
int main () {
    int n=10;
    int [] arr = {10, 20, 30};

→ System.out.println(arr[1]);
}
```

#ref

0	1	2
10	20	30

→ 20

main {

arr: #ref

n=10

Stack

Break till 10:34 Pm

Q) Swap the values of 2 variables.

$$a = 10 \qquad b = 20 \quad \rightsquigarrow \quad a = 20 \qquad b = 10$$

//incorrect way

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


    a = b;
  → b = a;
}
```

```
   20
  ┌────┐          ┌────┐
  │ 10 │          │ 20 │
  └────┘          └────┘
    a                b
```

// Correct way

temp → 10

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

    int temp = a;
    a = b;
  → b = temp;
}
```

```
  ┌────┐          ┌────┐
  │ 20 10 │       │ 10 20 │
  └────┘          └────┘
    a                b
```

// function game

Quiz

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

```
          10        20
           ↓         ↓
Public static void Swap (int a, int b) {
    int temp = a;
    a = b;
    b = temp;
}
```

Swap {
    temp = 10
    b = 20 10
    a = 10 20
}

main {
    b = 20
    a = 10
}

⌐ variables of **2** functions are not **Connected**.

```
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;
}
```

HEAP

#ref1   0   1

| 10 20 | 20 10 |

~~temp = 10~~

~~arr = #ref1~~   Swap

main

arr = #ref1

Stack

↳ arrays across functions are connected.

Q) Swap indexes

└> Given *array* of *length N* and *two indexes idx1*
and *idx2*, Swap the *element of* those two indexes.

$$Ex: \ arr[5] : \{5 \ \ \underset{35}{\cancel{15}} \ \ 25 \ \ \underset{15}{\cancel{25}} \ \ 45\}$$

      0   1   2   3   4

$$idx1 = 1 \qquad idx2 = 3$$

```
int temp = arr[idx1];          temp → 15
arr[idx1] = arr[idx2];
→ arr[idx2] = temp;
```

80%.

60%. dsa

5 rounds

3 rounds
dso
↓
4 rounds

1 dev
+
core

HR