9 2018 November Friday

October 2018

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Array in C++

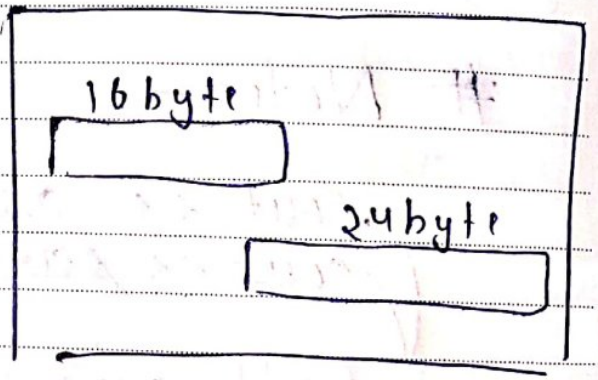
In Array, If we talk about contiguous Allocation,
so there might be chance to waste of some Memory.

Ex

int arr[10]

↑

10 × 4 byte = 40 byte



10 Saturday

There is no 40 byte available in memory for contiguous space.

During Memory Allocation

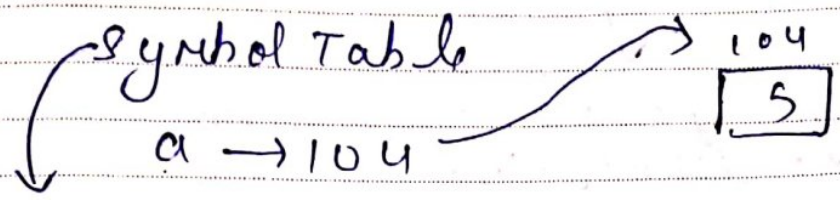
int a = 5

In this Case, 104

5	4 byte
a	

harara variable directly map hi krta 5 value ko

Yaha ek Symbol Table ka concept hota hai



ye Kamara Compiler automatically sambhalta hai.

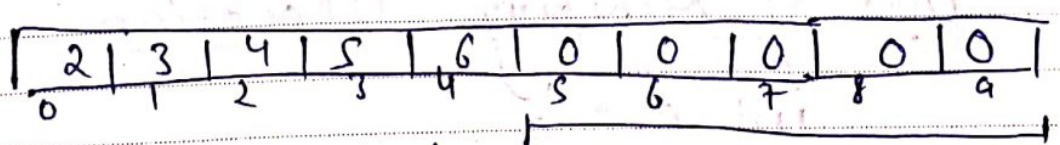
Notes -

cout << arr << endl;
cout << &arr << endl;

Thursday 8

Both represent Base address.

R int arr[10] = { 2, 3, 4, 5, 6 }



Baaki empty locations par automatically 0 insert ho jayega.

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int arr[4] = {4, 5, 6, 7, 8}

It give error, size is 4, but you insert 5 element.

---

arr[1] = value at (104 + 1 x 4)
BA, T index, Byte

104 + 4

value at (108)

---

6 Tuesday

```
int n;
cin>>n;
int arr[n];
```

This is Bad Practice.

Array with function is an example of Pass by reference.

Array pass krte time hume size bhi pass krna pdeda kyuki,

suppose arr[5] = {3, 2}

sizeof(arr) = 5 but array me bs 2 element daala hai, so size pass krne se clarify rhenge.

Sun	Mon	Tue	Wed	Thu	Fri	Sat
30	31					1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29

Note - Swapping

① Method 1 → using third variable.

a = 10, b = 20

```
int temp = a
a = b
b = temp
```

use extra variable.

② Method 2 → without using extra variable.

a = 10 b = 20

Sunday 4

30

```
a = a+b
b = a-b
a = a-b
```

30-20
30-10

a [10] 30

b [20] (10)

(20)

या

200

```
a = a*b
b = a/b
a = a/b
```

200/20
200/10

a [10] 200

b [20] [10]

[20]

पहले b में 20 आया, फिर b = a/b से
Again b का use करने [b = 10]

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October 2018

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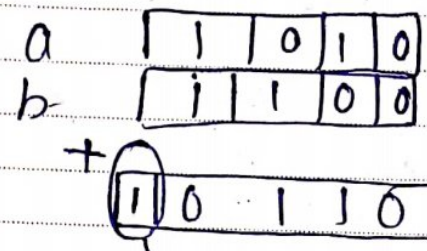
$\frac{200}{10} = 20$ आयेगा।

But there is chance to exceed or overflow the bytes.

suppose $a = 10$, $b = 12$



if ignore ↘ so 0 1 1 1 0

So Ans = 6 ⟵ this is wrong.

2 Friday

Method 3

$a = 5 \rightarrow 0101$
$b = 6 \rightarrow 0110$

$a = a \wedge b = 0101 \wedge 0110$

$a = 0011$

$b = a \wedge b = 0011 \wedge 0110$

$b = 0101$

$a = a \wedge b = 0011 \wedge 0101$

$a = 0110$

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

→ dynamic Array

Vector - It is a Dynamic Array Data structure.

Vector is same like Array, value daalte time vector ka size hum dynamically change kr skte. hai.

When need extra space, so vector apna size automatically 2x kr lega.

1D dynamic Array

```
vector<int> arr;
```

Initialisation

dynamic Array Creation →

```
vector<int> arr(10, 20, 30 ...);
vector<int> arr(10, -1)
```

(10 → array size, -1 → value)

```
int n
cin>>n
vector<int> arr(n);
```

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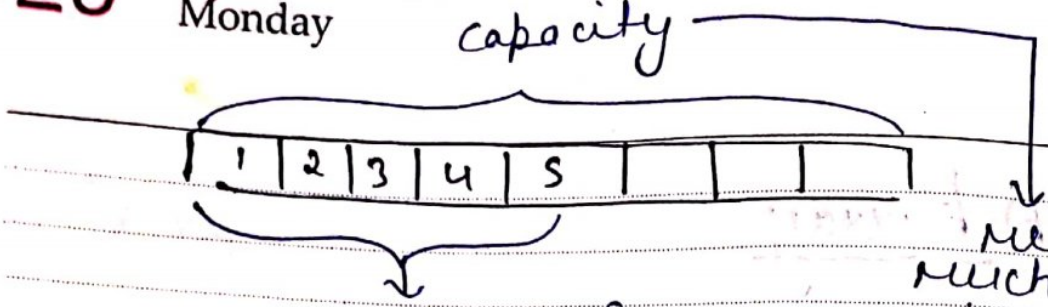

Jitni value hai, utne array ki size hum arr.size() operator

means how much, we can insert a value.

size();
capacity();

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Saturday 27

2D Array

Row Major formula

$$c * i + j$$

row column

```
int arr[3][3]
```

	col0	col1	col2
row0	5	7	9
row1	12	4	2
row2	1	6	7

Actual Case stored in memory (like linearly)

28 Sunday

0	1	2	3	4	5	6	7	8
5	7	9	12	4	2	1	6	7

r = no. of rows
c = no. of columns
i → ith row
j → jth column

row = 3
col = 3
total = 3 x 3 = 9

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Thursday

September 2018

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30						1
2	3	4	5	6	7	8
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16	17	18	19	20	21	22
23	24	25	26	27	28	29

If hum 2D Array, kisi function ko pass krte hai to,

1st Bracket ko chodkr, 2nd wale brack ko bound or size of column dena pdega

```
void getMinMax (int arr [][3], int row, int col)
                                  I
                          I bound dena pdega
```

26 Friday

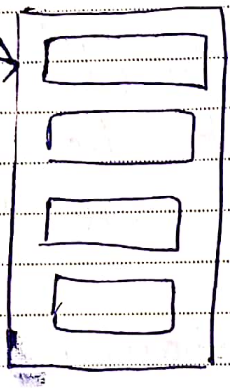
1D Vectour → vectour < data type > name ;

2D Vectour → vectour <vectour <int>> name
(int → datatype)

vectour <vectour <int>> arr (Row, vectour<int>(col, value));

- arr → vectour Name
- Row → outervectour ka size
- col → inner vectour ka size
- vectour<int>(col, value) → outervectour me jo rhega ek or vectour int type ka
- value → innervectour me kya value assign rhega

outer vectour →



→ vectour<int> a(size, value);

```
int row = arr.size();
int colom = arr[0].size();
```

```
arr[i].size();
```

- hr row me different no. of columns ho to hai unka size.

On String we simply iterate four loop to get individual character

```
string s = "Aakash";
for(int i=0; i<s.length(); i++)
{
cout<<"index "<<i<<" "<<s[i]<<endl;
}
```

Output

```
index a
index a
index a
index h
index b
index b
```