POINTER - LEVEL 2

09 October 2023 10:37

08|10|2023

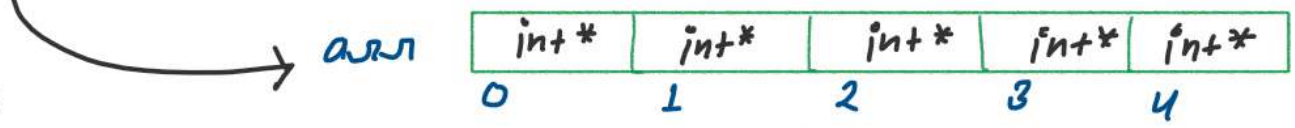
POINTER CLASS 2

✅CONCEPT 01: Array of pointer

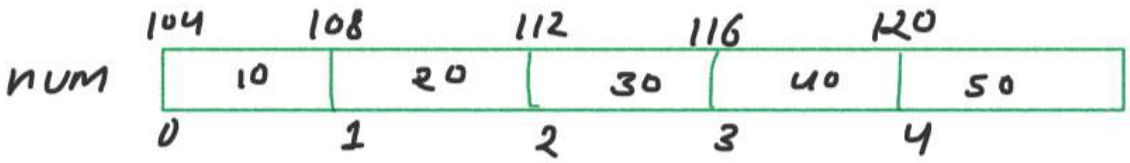
Syntax – `int *arr[5];`

Array of pointers: Ek aisa array jiska har ek element apne aap me hi pointer hota hai

Look like this

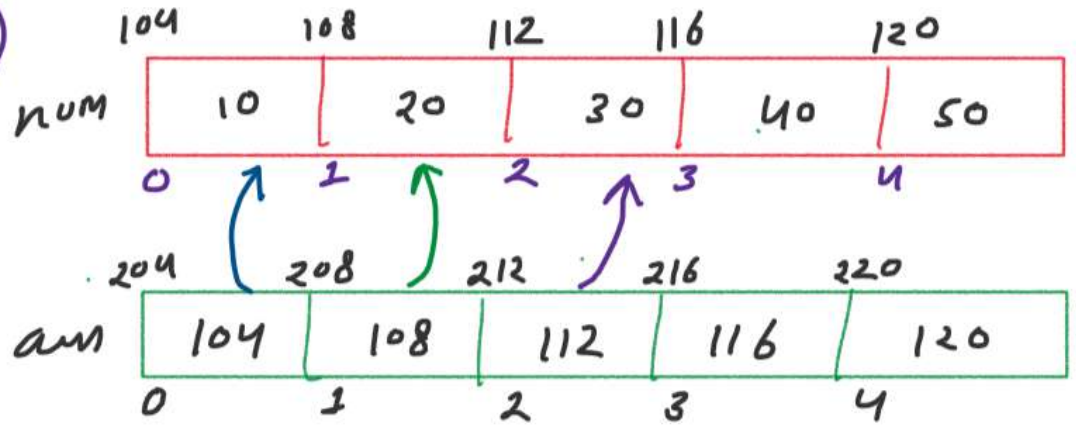


Array – `int num[5] = {10, 20, 30, 40, 50};`



Assign address of array &nums[i] to each pointer element of array arr[i]

```
arr[0] = &arr[0];
arr[1] = &arr[1];
arr[2] = &arr[2];
arr[3] = &arr[3];
arr[4] = &arr[4];
```



Print

num = 104

&num = 104

*num = 10

&num[0] = 104

arr = 204

&arr = 204

*arr = 104

&arr[0] = 204

*arr[0] = *(104) = 10

*arr[1] = *(108) = 20

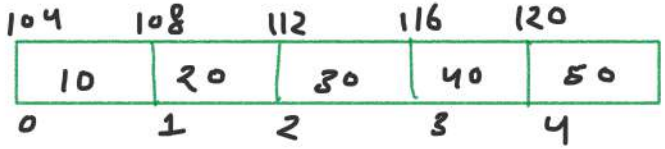
*arr[2]+1 = *(112)+1 = 30+1 = 31

arr[3] = 116

*(arr[0]+1) = *(104+4) = *(108) = 20

✅CONCEPT 02: Pointer to an array

```
int num[5] = {10,20,30,40,50};
```



Case 01: Pointer to an array:

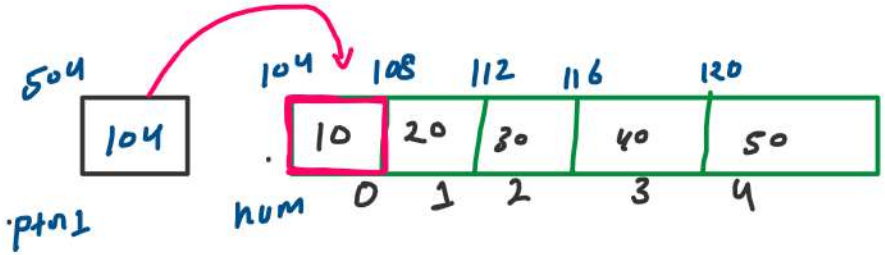
Syntax `int* ptr1 = num;`

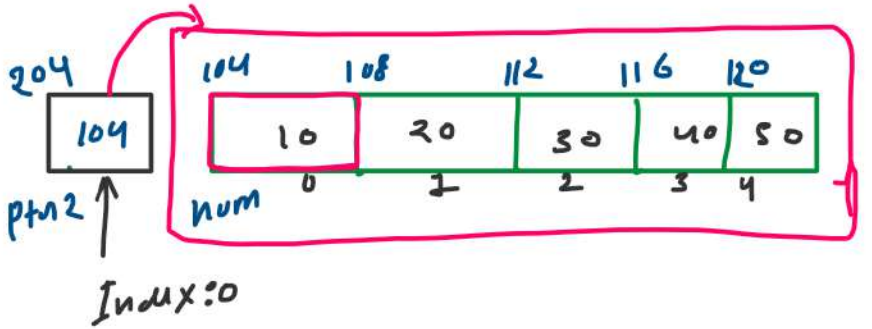
num ka iska mtlb: *"ptr1" point to starting element of address of array*

Case 02: Pointer to an array:

Syntax `int (*ptr2)[5] = &num;`

&num ka iska mtlb: *"ptr2" point whole array with starting element of address of pointed array*





Print

num = 104

&num = 104

&num[0] = 104

num[0] = 10

ptn1 = 104

&ptn1 = 504

&ptn1[0] = ERROR

*ptn1 = *(104) = 10

ptn2 = 104

*ptn2 = 104

&ptn2[0] = 104

ptn2[0] = 104

*(ptn2+0) = *(104) = 10

*(ptn2+1) = 20

*(ptn2+4) = 50

&ptn2 = 204

*ptn2[0] = 10 ✓

*ptn2[1] = Random value

✅CONCEPT 03: Pointer with functions

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

Before solu

cout
- arr = 104
- &arr = 104
- sizeof(arr) = 12
- Print Array = 10,20,30

```
    solu(arr, 3);
```

After solu

cout
- Print Array = 11,20,30

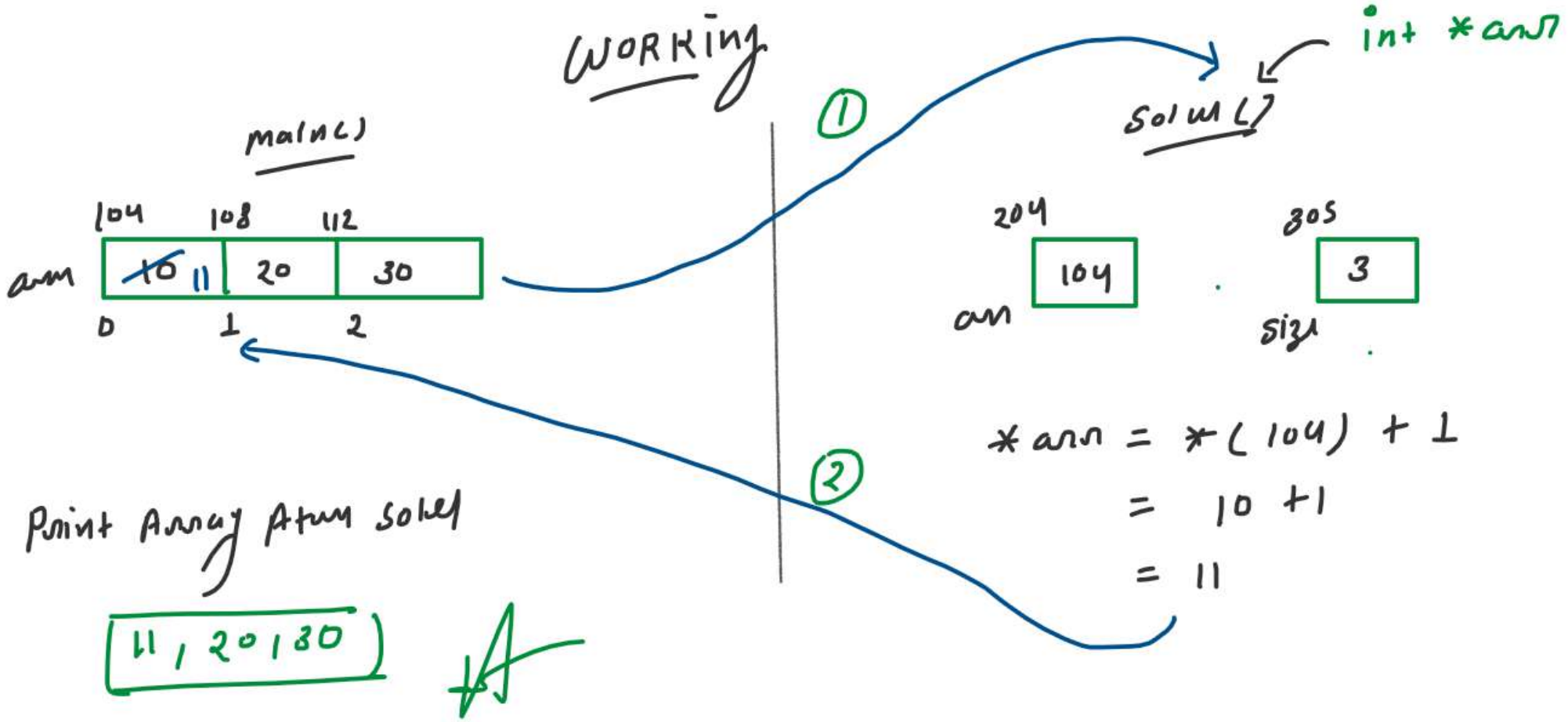
```
    return 0;
}
```

```
solu(int *arr, int siz)
```
OR
```
solu(int arr[], int siz){
    *arr = *arr + 1;
```
= 10 + 1
= 11

cout
- arr = 104
- &arr = 204
- sizeof(arr) = 8

```
}
```

size of pointer not Array


WORKING
int *ann
main()
solve()
1
2
104
108
112
arr
10
11
20
30
0
1
2
204
104
arr
305
3
size
*ann = *(104) + 1
= 10 + 1
= 11
Print Array from solve
11, 20, 30

✅CONCEPT 04: Pointer to pointer

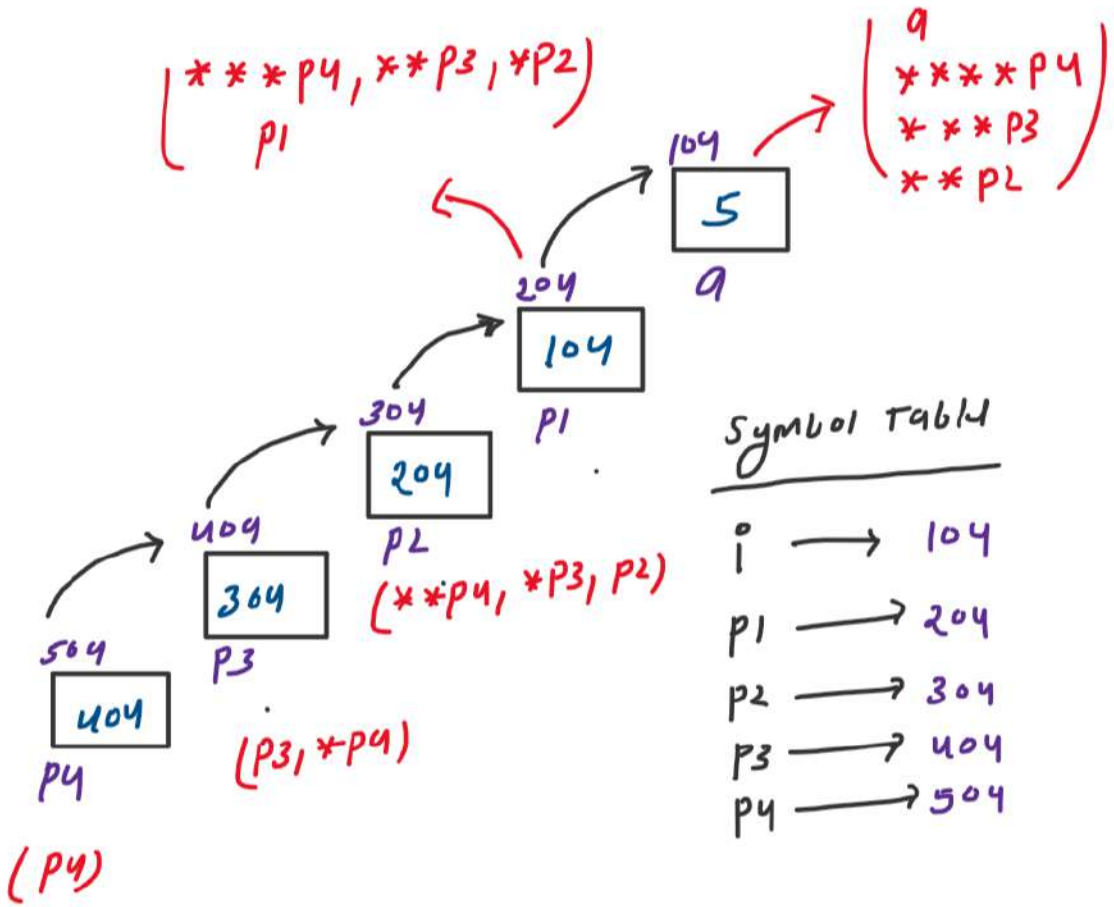
```
int a = 5;
```

p1 pointing to integer → `int *p1 = &a;`

p2 pointing to *p1 → `int **p2 = &p1;`

p3 pointing to **p2 → `int ***p3 = &p2;`

p4 pointing to ***p3 → `int ****p4 = &p3;`



cout

a = ****p4 = ***p3 = **p2 = *p1 = 5

p1 = ***p4 = **p3 = *p2 = 104

p2 = **p4 = *p3 = 204

p3 = *p4 = 304

p4 = 404

cout

&a = 104

&p1 = 204

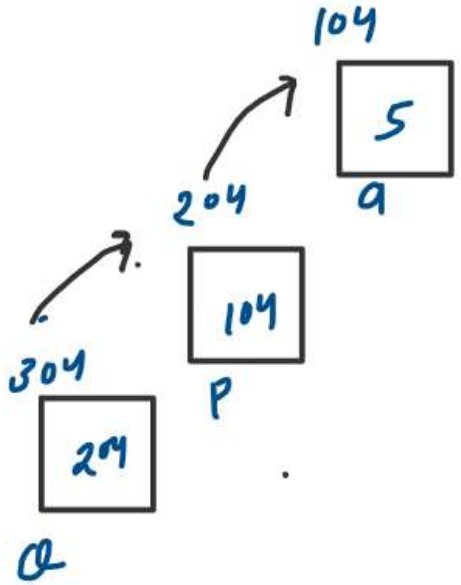
&p2 = 304

&p3 = 404

&p4 = 504

Q1 (L)

```
int a = 5;
int* p = &a;
int** q = &p;
```



Cout

a = 5	p = 104	q = 204
&a = 104	&p = 204	&q = 304
*a = ERROR	*p = 5	*q = 104
		**q = 5

Q:②

```
① int a = 10
② int *p = &a;
③ int **q = &a;
```

which line produce the error

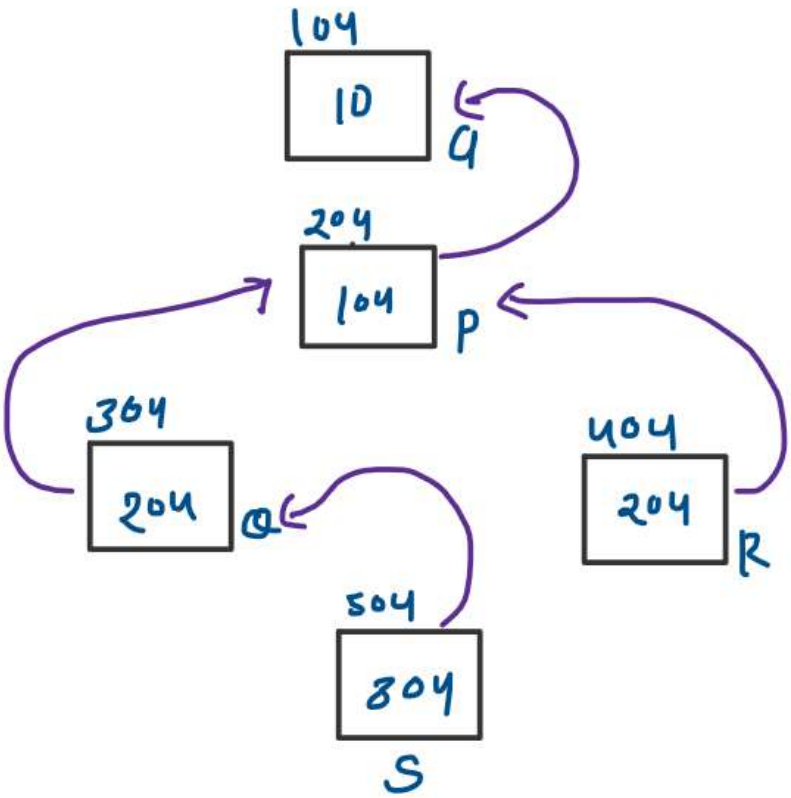
Ans Line ③

Correct line ⇒ int **q = &p;

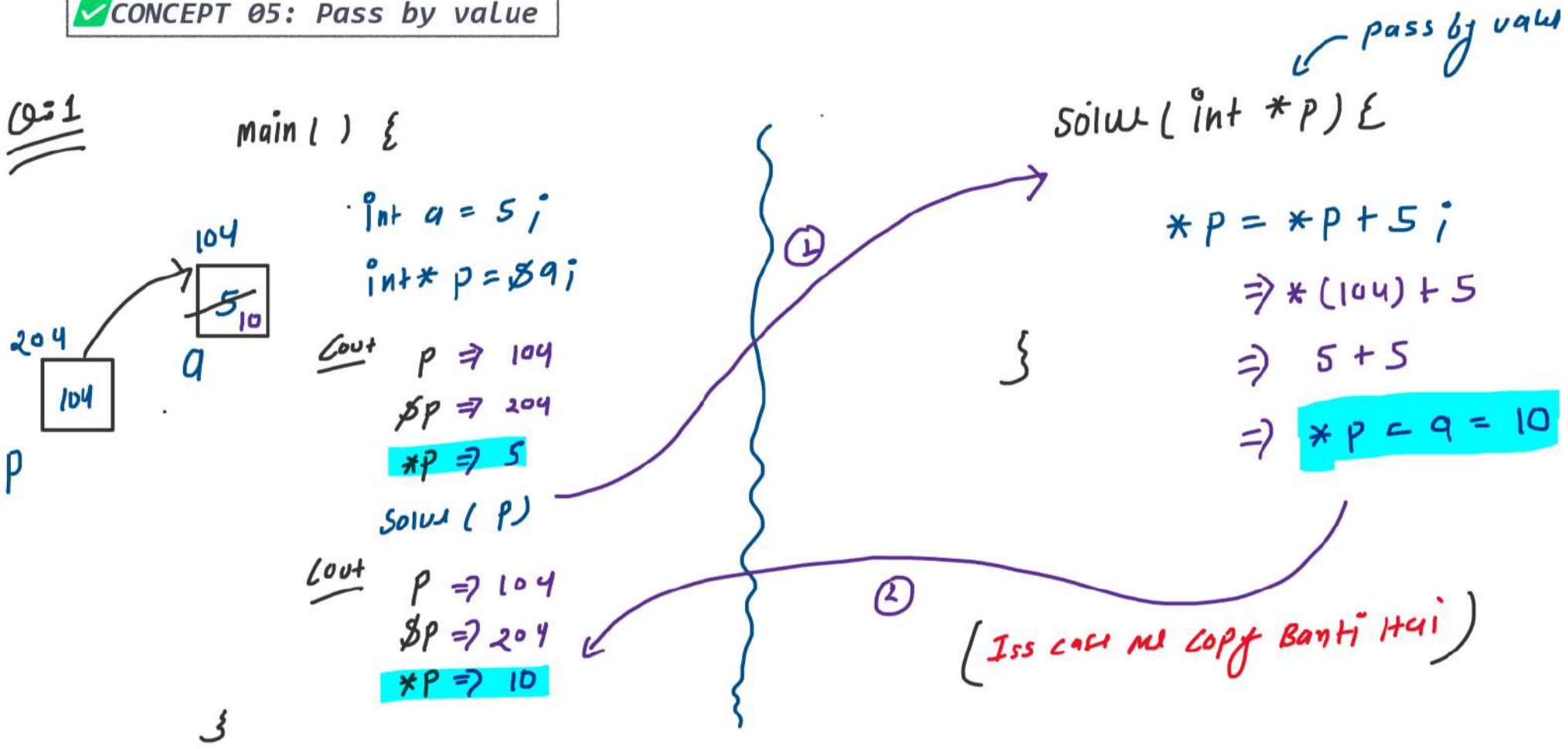
Q:3

```
int a = 10;
int *p = &a;
int **q = &p;
int **r = &p;
int ***s = &q;
```

Draw Diagram

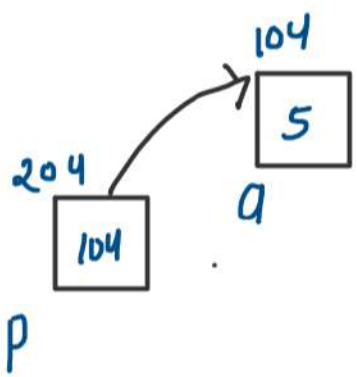


✅CONCEPT 05: Pass by value



Qs 2

```
main ( ) {
    int a = 5 ;
    int* p = &a ;
    cout  p ⇒ 104
          &p ⇒ 204
          *p ⇒ 5
    solve ( p )
    cout  p ⇒ 104
          &p ⇒ 204
          *p ⇒ 5
}
```



pass by value

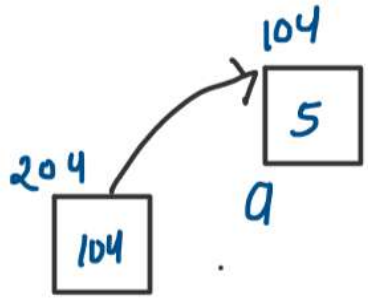
```
solve ( int *p ) {
    p = p+1 ;
    ⇒ 104+1 bytes ⇒ 104+4
    ⇒ p = 108
}
```

Duplicate p

✅CONCEPT 06: Pass by reference

Q:1

```
main ( ) {
    int a = 5 ;
    int* p = &a ;
    cout  p ⇒ 104
          &p ⇒ 204
          *p ⇒ 5
    solve ( p )
    cout  p ⇒ 104
          &p ⇒ 204
          *p ⇒ GAR. value
}
```




```
solve ( int* &p ) {
    p = p + 1 ;
}
```