Practice v11

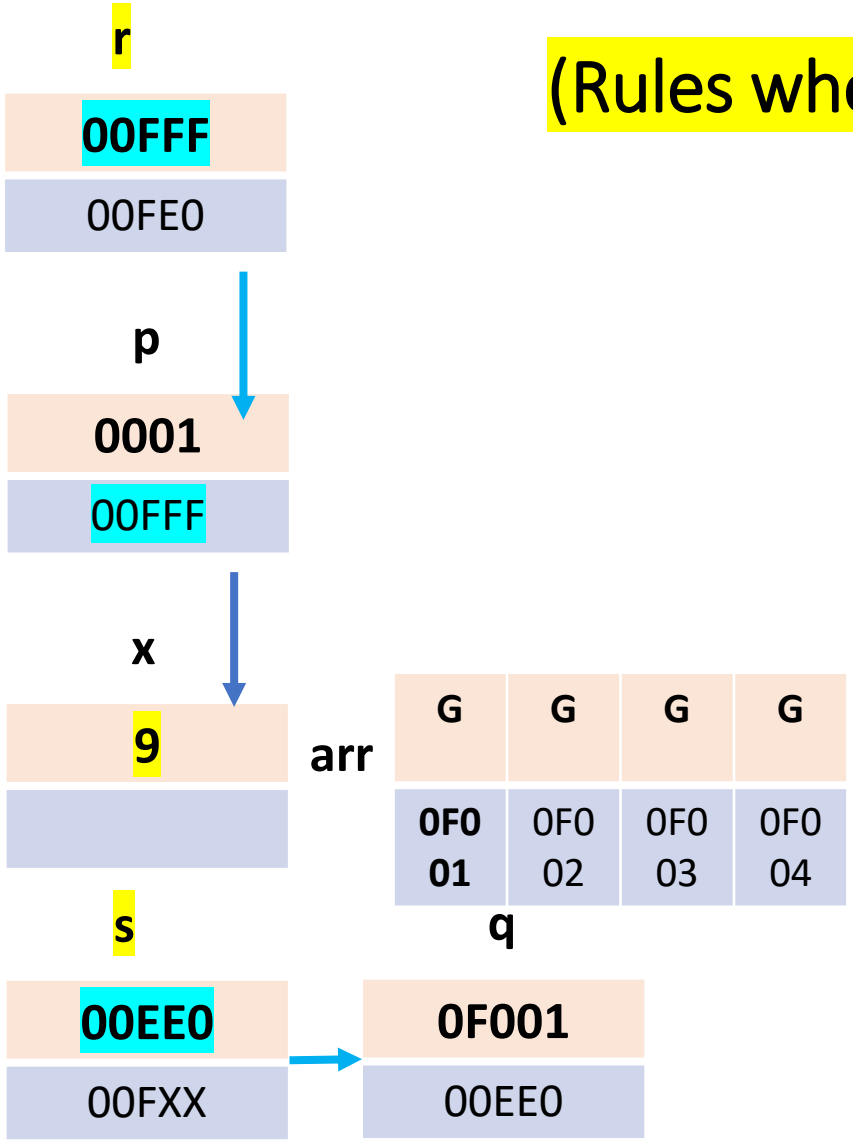
Pointers and pointers to pointer

Which of the following statements are incorrect?

```
#include <iostream>
#include <cstring>
using namespace std;
int main()
{
    int x = 9, int y = 7;
    int arr[4];
    int* p,*q;
    int** r, ** s;
    p = &x;
    r = &p;
    s = &q;
    q = arr;
    p = q;
    p = &q;
    r = s;
    r = &s;
    x = y;
    x = &y;
    r = arr;
    return 0;
}
```

Guide to solve..

(Rules when we have & with variable/pointer)



Level n ...

Means R.H.S has address of variable/pointer itself

Level 2 **r

Address of r can only be stored at level i+1 thing. Assume level of r is i

i.e. &r can be stored only in three level pointers (int ***)

&r

Level 1 *p

Address of p can only be stored at level i+1 thing. Assume level of p is i

i.e. &p can be stored only in two level pointers (int **)

&p

Level 0 x

Address of x can only be stored at level i+1 thing. Assume level of x is i

i.e. &x can be stored only in single level pointers (int *)

&x

```
p = q;
p = &q;//error
```

q has level 1, thus you can assign its address to only level 2 thing! i.e. LHS should have level 2 thing.. In this case, LHS has level 1 thing

```
r = s;
r = &s;//error
```

s has level 2, thus you can assign its address to only level 3 thing! i.e. LHS should have level 3 thing.. In this case, LHS has level 2 thing

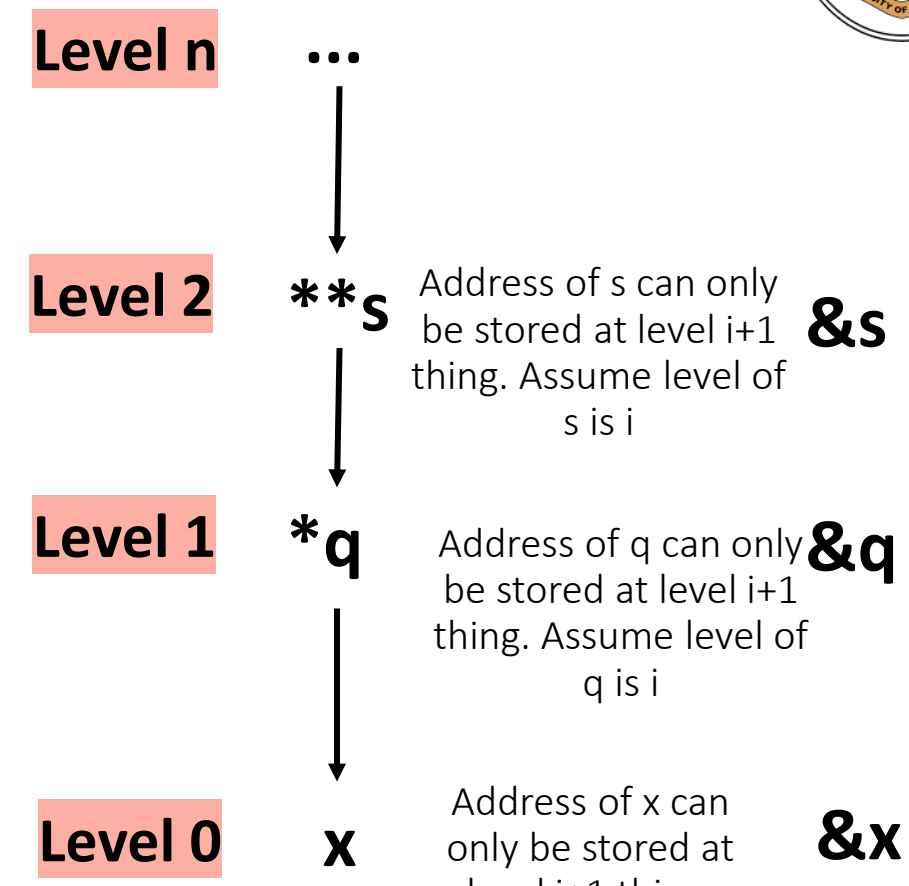
```
x = y;
x = &y; //error
```

y has level 0, thus you can assign its address to only level 1 thing! i.e. LHS should have level 1 thing.. In this case, LHS has level 0 thing

```
r = arr;//error
```

arr has level 0, thus you can assign its address to only level 1 thing! i.e. LHS should have level 1 thing.. In this case, LHS has level 2 thing

	x	arr	p	q	r	s
Level	**0**	0	1	1	2	2



Note:

- The rule that we just discussed considers only the case in which ***you explicitly use & sign at the RHS with variable/pointer..***

- The other rules we have discussed earlier says:

Nature of contents at L.H.S must match the nature of contents at R.H.H

No & sign at RHS

Guide to solve..

(Rules when we have variable/pointer without & sign)

Means R.H.S has name of pointer/variable

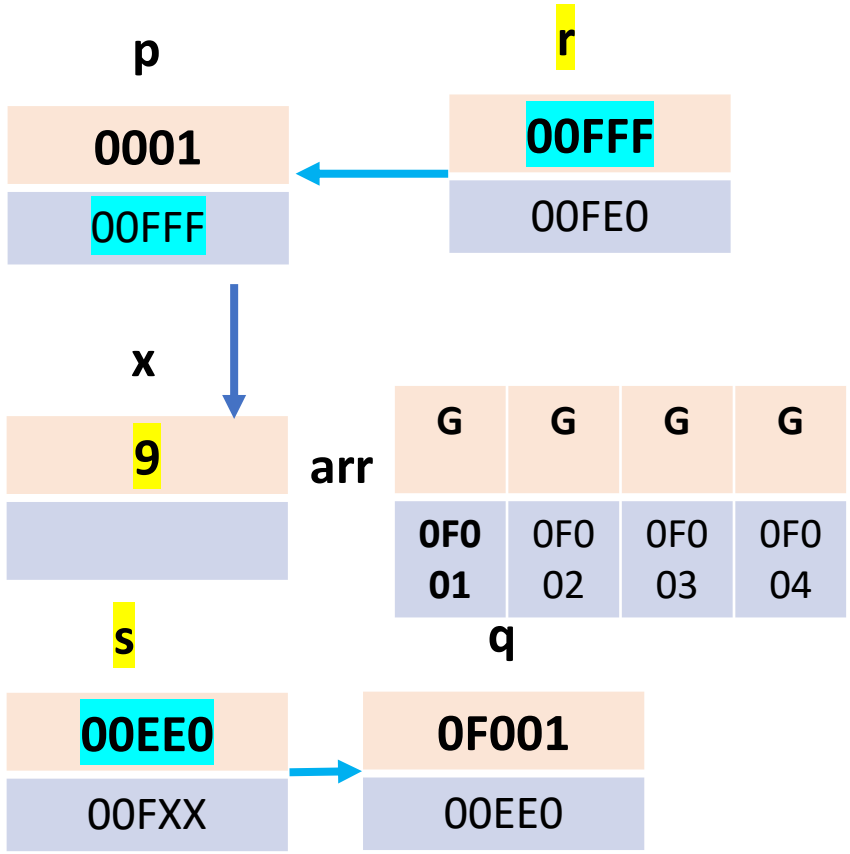
Level n	…			
Level 2	****r**	Contents of r can only be stored at level i thing. Assume level of r is i	i.e. r can be stored only in two level pointers (int **)	**r**
Level 1	***p**	Contents of p can only be stored at level i thing. Assume level of p is i	i.e. p can be stored only in one level pointers (int *)	**p**
Level 0	**x**	Contents of x can only be stored at level i thing. Assume level of x is i	i.e. x can be stored only in level 0 thing (int)	**x**

No & sign at RHS

Guide to solve..

(Rules when we have variable/pointer without & sign)

Means R.H.S has name of pointer/variable




```
p = q;
r = s;
x = y;
```

q has level 1, thus you can assign its contents to only level 1 thing! i.e. LHS should have level 1 thing.. In this case, LHS has level 1 thing

s has level 2, thus you can assign its contents to only level 2 thing! i.e. LHS should have level 2 thing.. In this case, LHS has level 2 thing

y has level 0, thus you can assign its contents to only level 0 thing! i.e. LHS should have level 0 thing.. In this case, LHS has level 0 thing

No error