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## Tutorial

### Question 1.

```
int mul (Node root) {  
    if (root == null) return 1;  
    else root.val * mul(root.left)  
                * mul(root.right);  
}
```

```
int mul(Node root){  
    if (root==null) return 1;  
    else if (root.val == 0) return 0;  
    else  
        root.val*mul(root.left)*mul(root.right);  
}
```

Rewrite the above function to short-circuit the traversal if **val** of a node in the binary tree is 0?

### Question 2.

```
void swap(int x, int y) {  
    int t = x;  
    x = y;  
    y = t;  
}  
void main() {  
    int a[] = {2, 1, 0}; i = 0;  
    swap(i, a[i]);  
    cout << i << a[0] << a[1] << a[2];  
}
```

What are the values printed out when:

- A. x,y are passed by value    0210
- B. x,y are passed by value-result    2010
- C. x,y are passed by reference    2010
- D. x,y are passed by name    2210

### Question 3.

```
type VECT = array [1..3] of integer;  
    VECTPTR = ^VECT;  
procedure SUB1;  
var A, B: VECT;  
P, Q: VECTPTR;  
begin  
A[1] := 7; A[2] := 8; A[3] := 9;
```



```
B[1] := 7; B[2] := 8; B[3] := 9;
P := @A; Q := @B;
SUB2(P, Q);
end;
procedure SUB2(R: VECTPTR; var S: VECTPTR);
begin
    R^[1] := R^[1] + 10; //1
    S^[1] := S^[1] + 10; //2
    if ... then R := S; //3
        else S := R; //4
end;
```

Which is **object** changed by the following assignment and what is the value assigned?

- A. at line //1
- B. at line //2
- C. at line //3
- D. at line //4

#### Question 4.

```
n := 5;
for i := 1 to n do begin
    n := n + 1;
    i := i - 1;
end
```

How many iterations does the for loop perform when?

- A. expr2 is protected
- B. index is protected
- C. no protect
- D. both index and expr2 are protected