

What will be displayed in the screen after the following program executes, provided the formal parameter denoted with & will be transferred by:

- a. value
- b. value/result
- c. reference
- d. name

```
int a[5];
int i,X=1;

void swap (int&a, int&b,int&c)
{
    int t;
    {
        c++;
        t = a+X+c; a = b; b = t;
    }
}

void main()
{
    for (i=0;i<5;i++) a[i] = 6 - i;
    i = 2;
    swap(i, a[i],X);
    printf(“%d%d%d%d%d”,i,a[0], a[1], a[2], a[3], a[4]);
}
```

---

a.

```
int a[5];
int i,X=1;

void swap (int&a, int&b,int&c)
{
    int t;
    {
        c++;
        t = a+X+c; a = b; b = t;
    }
}

void main()
{
    for (i=0;i<5;i++) a[i] = 6 - i;
    i = 2;
    swap(i, a[i],X);
    printf(“%d%d%d%d%d”,i,a[0], a[1], a[2], a[3], a[4]);
}
```

Initially:

```
a[0] = 6
a[1] = 5
a[2] = 4
a[3] = 3
```

a[4] = 2  
i=2  
X = 1

```
swap(i, a[i],X);  
void swap (int&a, int&b,int&c)  
int t;  
{  
c++;  
t = a+X+c; a = b; b = t;  
}
```

a = i = 2 → 4;  
b = a[2] = 4 → 5  
c = X = 1 → 2  
t = 5

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i = 2  
a[0] = 6  
a[1] = 5  
a[2] = 4  
a[3] = 3  
a[4] = 2

### b. value/result

Initially:

a[0] = 6  
a[1] = 5  
a[2] = 4  
a[3] = 3  
a[4] = 2  
i=2  
X = 1

```
swap(i, a[i],X);  
void swap (int&a, int&b,int&c)  
int t;  
{  
c++;  
t = a+X+c; a = b; b = t;  
}
```

a = i = 2 → 4;  
b = a[2] = 4 → 5  
c = X = 1 → 2  
t = 5

i = a = 4  
a[2] = b = 5

$X = c = 2$

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```
i=4
a[0]=6
a[1]=5
a[2]=5
a[3]=3
a[4]=2
```

### c. reference

Initially:

```
a[0] = 6
a[1] = 5
a[2] = 4
a[3] = 3
a[4] = 2
i=2
X = 1
```

```
swap(i, a[i], X);
void swap (int&a, int&b, int&c)
int t;
{
c++;
t = a+X+c; a = b; b = t;
}
```

```
(a) → i = 4
(b) → a[2] = 6
(c) → X=2
    t = 6
```

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### d. name

Initially:

```
a[0] = 6
a[1] = 5
a[2] = 4
a[3] = 3
a[4] = 2
i=2
X = 1
```

```
swap(i, a[i], X);
```

```
void swap (int&a, int&b,int&c)
int t;
{
c++;
t = a+X+c; a = b; b = t;
}
```

```
void swap (int&a, int&b,int&c)
int t;
{
X++;
t = i+X+X; i = a[i]; a[i] = t;
}
```

```
a[0] = 6
a[1] = 5
a[2] = 4
a[3] = 3
a[4] = 2
i=2
X = 1
```

```
a[0] = 6
a[1] = 5
a[2] = 4
a[3] = 3
a[4] = 6
i=4
X = 2
t= 6
```

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