

Exercise # 8 - Solution

(21-11-2001)

Exercise 1:

- Array index*: An integral value that indicates the component's position within the collection.
- Array size*: The number of components (elements) of the array.
- Out-of-bounds array index*: An index value that is either less than zero or greater than the array size minus one.
- Base address*: The memory address of the first element of an array

Exercise 2:

```
const int MAX_LENGTH = 30;  
char firstName[MAX_LENGTH];
```

```
length = 0;  
cin.get(letter);  
while (letter != ' ')  
{  
    firstName[length] = letter;  
    length++;  
    cin.get(letter);  
}
```

- `firstName[0] = 'A';`
- `for (index = 0; index < length; index++)
 cout << firstName[index];`

Exercise 3:

Given the declarations

```
int sample[8];  
int j, k;
```

show the contents of the array sample after the following code segments are executed. Use a question mark to indicate any undefined values in the array.

a.
for (k = 1; k < 8; k++)
 sample[k] = 10 - k;

?	9	8	7	6	5	4	3
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b.
for (j = 0; j < 8; j++)
 if (j <= 3)
 sample[j] = 1;
 else
 sample[j] = -1;

1	1	1	1	-1	-1	-1	-1
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c.
for (k = 0; k < 8; k++)
 if (k % 3 == 0)
 sample[k] = k;
 else if (k % 3 == 1)
 sample[k] = k + 1;

0	2	?	3	5	?	6	8
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Exercise 4:

Answer by true or false?

- Every component in an array must have the same type, and the number of components is fixed at compile time. **True**
- The components of an array must be of an integral type. **False**
- A structured data type is a data type that cannot be decomposed into further component parts. **False**
- Given the declarations
const int num_weeks = 5;
const int num_teams = 6;
int tickets[num_teams][num_weeks];
The number of rows and columns in tickets is 5 and 6 respectively. **False**

Exercise 5:

Given the following code segments, draw the arrays and their contents after the code is executed. Indicate any undefined values with letter U.

```
a. int exampleA[4][3];
   int x, y;

   for (x = 0; x < 4; x++)
       for (y = 0; y < 3; y++)
           exampleA[x][y] = x*y;
```

0	0	0
0	1	2
0	2	4
0	3	6

```
b. int exampleB[4][3];
   int x, y;

   for (x = 0; x < 3; x++)
       for (y = 0; y < 3; y++)
           exampleB[x][y] = (x + y) % 3;
```

0	1	2
1	2	0
2	0	1
U	U	U

```
c. int exampleC[8][2];
   int x, y = 1;

   exampleC[7][0] = 4;
   exampleC[7][1] = 5;
   for (x = 0; x < 7; x++)
   {
       if (y % 3 == 0)
       {
           exampleC[x][0] = 2;
           exampleC[x][1] = 3;
       }
       y++;
   }
```

U	U
U	U
2	3
U	U
U	U
2	3
U	U
4	5