

Exercise # 8 (21-11-2001)

Exercise 1:

Define the following terms:

- a. Array index
- b. Array size
- c. Out-of-bounds array index
- d. Base address

Exercise 2:

Given the declarations

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

- a. Write an assignment statement that stores 'A' into the first component of array firstName.
- b. Given the following program fragment, which reads characters into array firstName until a blank is encountered, write a for statement that prints out the portion of the array that is filled with input data.

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

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;
```

b.

```
for (j = 0; j < 8; j++)  
    if (j <= 3)  
        sample[j] = 1;  
    else  
        sample[j] = -1;
```

c.

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

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.
- The components of an array must be of an integral type
- A structured data type is a data type that cannot be decomposed into further component parts.
- 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.

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;
```
- 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;
```
- 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++;
}
```