INC 141
Computer Programming

Lab 6

Learning Outcomes (Lab 6)

- Declaration and use of 1D array
- 2D array

Array

Array is a group of data of the same type.

e.g.

A group of integers	**2 6 3 4**
A group of char	**‘a’ ‘v’ ‘j’ ‘d’**
A group of float	**1.2 2.3 7.1 6.5**

Array Declaration and Initialization

Use [ ] denote array
inside is number of data

```
int a[6];
```

Group of 6 integers

Use { } for initialization

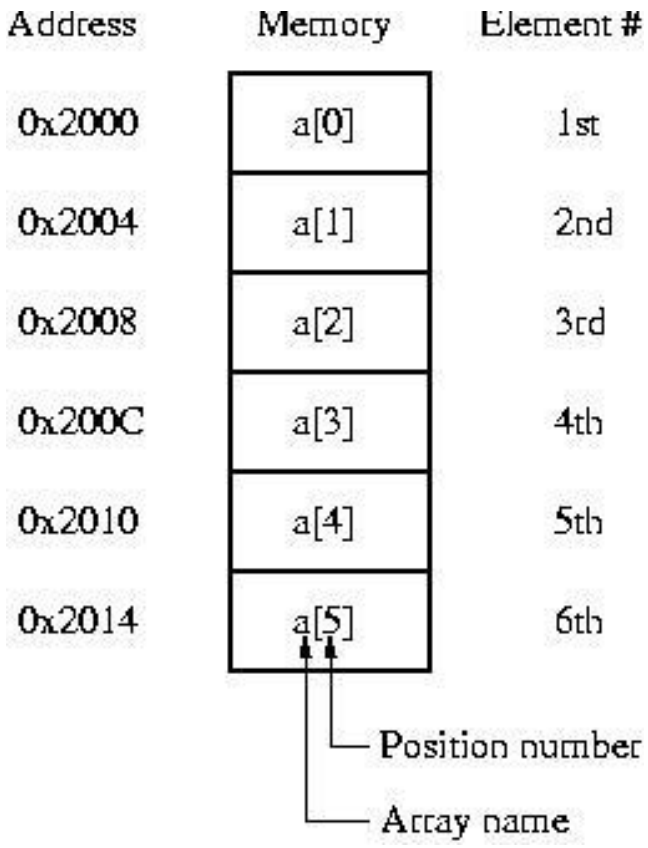
```
float b[4] = {2, 5, -4, 6};
```

Group of 4 floating point numbers with initial values

Array Indexing

- **Index starts from 0**
- **Index can be**
  Constant 0
  Variable i
  Expression i+2

int a[6];



Example 1

```
main ()

{
    int a[6];
    int b[6] = {1,2,3,4,5,6};
    int i = 3;

    a[0] = 100;
    b[4] = 200;
    a[i] = 300;
    a[i+2] = 400;
}
```

Add
b[7] = 500;

Use debugger to investigate.

Task 1 (Individual)

Write a program that move all the data from array b to a.

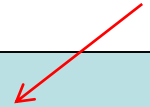
Hint: Do it one-by-one

2-Dimensional Array

```
int b[2][3];
```

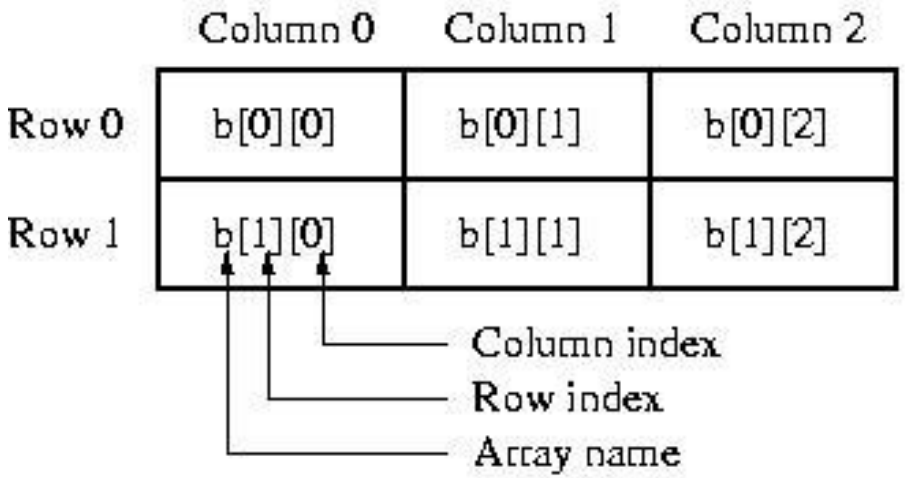
2 Rows 3 Columns
(6 integers)

Use 2 layers of { }
for initialization

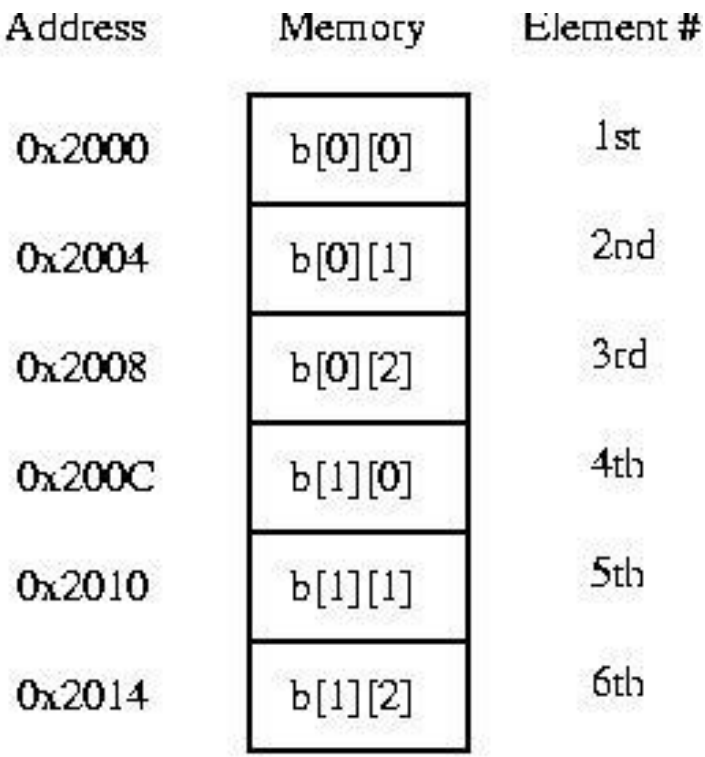


```
int b[2][3] = {{2, 5, 0}, {-4, 6, 1}};
```

2-Dimensional Array Indexing



(a)



(b)

Example 2

```
main ()

{
    float a[2][3];
    float b[2][3] = {{1,2,3},{4,5,6}};

    a[0][0] = 100;
    a[1][2] = b[0][1];
    b[1][0] = 200;
}
```

Use debugger to investigate.

Task 2 (upload to LEB2)

Write a program that move all the data from array b to a.

Hint: Use nested loop

Task 3 (Flowchart / LEB2)

Write a flowchart/program that calculate the average of all numbers in the array and print it out on the screen.

```
int a[6] = {1,2,3,4,5,6};
```

Hint:
Use a loop to calculate the sum of all numbers in the array first.