

## LAB EXERCISE 4

### TOPIC: ARRAY

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SECTION: 5

1. Define the following arrays

- a) heights, 15 elements of type float.

```
float heights[15];
```

- b) ages, 9 elements of type integer.

```
int ages[9];
```

- c) metrics, 10 elements of type string.

```
string metrics[10];
```

2. Given the definition of the array. Give reason why definition is not correct.

- a) `float points[6.5];`

floating size is not allowed

- b) `int sizeLimit;`

```
int address[sizeLimit];
```

sizeLimit is variable not constant

- c) `char category[-8];`

negative value for array size is not allowed

- d) `double length[];`

cannot declare array without size and initiallizer

3. Write C++ statements to perform each of the following:

- a) Declare an array named `tests` to allocate 5 elements of type double.

- b) Show the memory allocations of the array named `tests`.

Index	0	1	2	3	4
Value	0	0	0	0	0

- c) Read the value 25 from the keyboard and assign it into the array named `tests` of index 3.

- d) Show the memory allocations of the array named `tests`.

Index	0	1	2	3	4
Value	0	0	0	25	0

- e) Add the content of index 3 with the value 20 and assign the result into `tests [4]`.

- f) Show the memory allocations of the array named `tests` after question (e).

Index	0	1	2	3	4
Value	0	0	0	25	40

```
1  #include <iostream>
2  using namespace std;
3  int main(){
4      const int SIZE=5;
5      double tests[SIZE]={0,0,0,0,0};
6      int n;
7      for (n=0;n<SIZE;n++){
8          cout<<"tests["<<n<<"] = "<<tests[n]<<endl;
9      }
10     cout<<endl;
11     cout<<"Please enter a number for tests[3]: ";
12     cin>>tests[3];
13     for (n=0;n<SIZE;n++){
14         cout<<"tests["<<n<<"] = "<<tests[n]<<endl;
15     }
16     cout<<endl;
17     tests[4]=tests[3]+20;
18     for (n=0;n<SIZE;n++){
19         cout<<"tests["<<n<<"] = "<<tests[n]<<endl;
20     }
21 }
```

```

1 //Program 5.1
2 #include <iostream>
3 using namespace std;
4
5 int main() {
6     const int SIZE = 4;
7     double score[SIZE];
8     int i;
9
10    cout << "Enter " << SIZE << " of doubles: ";
11    for (i = 0; i < SIZE; i++)
12        cin >> score[i];
13    cout << "The scores are: \n";
14    for (i = 0; i < SIZE; i++)
15        cout << score[i] << endl;
16    return 0;
17 }

```

4. Given the following programs. Show the memory layout of the array and explain each statement.

line 6 declare SIZE=4

line 7 declare an array named score with array size 4

line 10-12 loops that require user enter 4 value which will store in name[0 ] to name[3]

line 13-15 loops to shows 4 value that store in name[0] to name [3] which enter by users

Memory layout:

Assume value enter is 1.0,2.0,3.0,4.0

Index	Output
Name[0]	1.0
Name[1]	2.0
Name[2]	3.0
Name[3]	4.0

5. Identify which of the following array declaration are invalid. If a declaration is invalid, explain your answer.

a) `int digits[8] = {2,4,5,3,5,1,8,0};`

valid

b) `int ids[5] = {101,202,303,404,505,606,707};`

invalid, too many initializer

c) `float length[] = {30.2,4.99,5.9};`

valid

d) `int size[8] = {67, ,66, , , 99,39,67};`

invalid, array element can't be empty

e) `char feel[] = {'c', 'i', 'n', 't', 'a', '\0'};`

valid

f) `char name[5] = "Azira";`

invalid, "Azira" contains 5 characters and needs one character for `\0` so the size of array needs to be 6.

g) `char name[20] = "Sharifah Aini";`

valid

6. Write a C++ program based on the following information, by using array (submit this question in .cpp file):

- Number of students = 10
- There are 10 marks of students to be saved

Student 1: 70

Student 2: 85

Student 3: 57

Student 4: 64

Student 5: 83

Student 6: 92

Student 7: 75

Student 8: 69

Student 9: 95

Student 10: 72

Based on the above information, calculate the total of marks for all students, and then calculate its average.