LAB EXERCISE 4

TOPIC: ARRAY

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SECTION: SECTION 02

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];`

   Size declarator of the array must be an integer

   b) `int sizeLimit;`
   `int address[sizeLimit];`
   The sizeLimit is not initialized yet

   c) `char category[-8];`
   The size declarator of the array must be a positive integer

   d) `double length[];`
   If size of array is implicit,all the elements should be listed out.

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

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

   double tests[5];

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

tests[0]	tests[1]	tests[2]	tests[3]	tests[4]
0	0	0	0	0

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

cin>>value;

tests[3]=value;

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

tests[0]	tests[1]	tests[2]	tests[3]	tests[4]
0	0	0	25	0

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

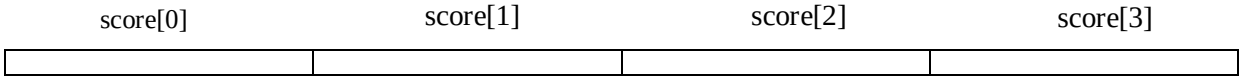
tests[4]=tests[3]+20;

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

tests[0]	tests[1]	tests[2]	tests[3]	tests[4]
0	0	0	25	45

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

```
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 }
```



LINE 6: Make the SIZE=4 so that when the SIZE is used,it will automatically use value of 4 throughout the program
LINE 7:Declare the array score with the size of 4 because the SIZE has initialized with value 4
LINE10:This line is used to display the output message and the SIZE will has output 4.The whole statement will has output: Enter 4 of doubles:
LINE11:allow user to input the score in a loop with repeat 4 times,and the i indicated the number of index.When number of index is greater than or equal to SIZE which is 4,it will out of loop
LINE12:allow user to enter input for the score[i]
LINE 13:display the output message which is the score are and the \n make program have next line output
LINE 14: allow user to input the score in a loop with repeat 4 times,and the i indicated the number of index.When number of index is greater than or equal to SIZE which is 4,it will out of loop
LINE 15: allow user to enter input for the score[i]

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 because there contains 7 elements which is exceed than the size declarator of array with 5

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

d) `int size[8] = {67, ,66, , , 99,39,67};`
Invalid.The element in the array cannot be initialized by skipped.

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

f) `char name[5] = "Azira";`
Invalid because the size declarator of the name is actually 6 which greater than 5 due to the there actually has '\0' at the end of the element.

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.