LAB EXERCISE 4

TOPIC: ARRAY

NAME: IRDINA HANNAH BINTI MISNUN
MATRIC NO: A24CS0086
SECTION: 02

1. Define the following arrays

    a) `heights`, 15 elements of type float
    b) `ages`, 9 elements of type integer
    c) `metrics`, 10 elements of type string.

Answer:

    a) float heights[15];
    b) int ages[9];
    c) string metrics[10]

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

    a) `float points[6.5];`
    b) `int sizeLimit;`
       `int address[sizeLimit];`
    c) `char category[-8];`
    d) `double length[];`

Answer:

    a) size declarator of array cannot be in decimal number only positive whole numbers
    b) sizeLimit does not have size declarator in it, suppose
       int sizeLimit=10;
       int address[sizeLimit];
    c) size cannot be in negative numbers
    d) it is not initialized with an initialization list and does not have size declarator

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`.
    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`.
    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).

Answer:

1. double tests[5];

2.

0	0	0	0	0
0	1	2	3	4

3. double tests[3]= 25;

4.

0	0	0	25	0
0	1	2	3	4

5. double tests[3] = 20+25;
   double tests[4]= 45;

6.

0	0	0	45	45
0	1	2	3	4

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   }
```

score[0]	score[1]	score[2]	score[3]

Answer =

Line1= Comment
Line 2= identifier for program
Line3= identifier for cout and cin
Line 5= main function definition
Line 6= declare constants used for size declarators
Line7= declare variable name of array
Line8= declare i variable
On line 10, it will display "Enter 4 of doubles: "
On line 11, program is set to repeat until the determined size
On line 12, user enter score and score are stored in the array. First score stored in subscript 0(score[0]), second score on subscript 1(score[1]) , third score on subscript 2(score[2]), fourth score on subscript 3(score[3]),
On line 13, display "The scores are: "
On line 14 , program is set to repeat until the determined size
On line 15, score will be displayed

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};`
b) `int ids[5] = {101,202,303,404,505,606,707};`
c) `float length[] = {30.2,4.99,5.9};`
d) `int size[8] = {67, ,66, , , 99,39,67};`
e) `char feel[] = {'c', 'i', 'n', 't', 'a', '\0'};`
f) `char name[5] = "Azira";`
g) `char name[20] = "Sharifah Aini";`

Answer:
a) valid
b) invalid, elements exceed the size of array
c) valid
d) invalid, there shouldn't be any empty spaces
e) valid
f) invalid, it exceeds the size of array because there is no place for null
g) 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.