LAB EXERCISE 4

TOPIC: ARRAY

NAME: KALAITHARAN A/L PALANYVELU
MATRIC NO: A24CS0091
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 metrices[10];
   ```

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

   a) `float points[6.5];`

   ```
   array size must be in integer.
   ```

   b)
   ```
   int sizeLimit;
   int address[sizeLimit];
   array size must be a constant.
   ```

   c)
   ```
   char category[-8];
   array size cannot be in negative.
   ```

   d)
   ```
   double length[];
   array size must be provided during declaration.
   ```

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[4]
   tests[5]
   ```

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

```
tests[3]= 25;
```

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

```
Tests[3] contains 25.
```

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[3] = 25.0
tests[4] = 45.0
```

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]

```
1  #include <iostream>
2  using namespace std;
3
4  int main()
5  {
6      const int SIZE = 4;      // Define constant
7      double score[SIZE];      // Declare array name
8      int i;                   // Declare integer i for loop
9
10     cout << "Enter " << SIZE << " of double: "; // Prompt the user to enter 4 score
11     for(i = 0; i < SIZE; i++) // Loop to read the number
12        cin >> score[i];
13
14     cout << "The scores are: \n"; //Output the score stored in the array.
15
16     for (i = 0; i < SIZE; i++) //Loop to display each value stored in the array
17     cout << score[i] << endl;
18
19     return 0;
20 }
```

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. Elements exceed size than declared.

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

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

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

f) `char name[5] = "Azira";`
   Invalid. Exceed size 5

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.