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1. The array is a type of data structure that is used to store homogeneous data in contiguous memory locations. Array could be helpful to store a large number of elements using a single variable. In C strings are defined as an array of characters. The difference between a character array and a string is the string is terminated with a special character '\0'. The advantage is str[] is a character array so using str without braces '[' and ']' will give the base address of this string as a result when do a scanf we didn't have to write '&' as it is already providing the base address of the string to scanf.

   References:

   - https://www.educba.com/strings-array-in-c/

2. Declaration means tell the compiler about the existence of an entity in the program and its location. When you declare a variable, you should also initialize it. Declaration structure is :

   dataType arrayName[arraySize] → int evenNumber[5];

   While the Initialization is the process of assigning a value to the Variable. Every programming language has its own method of initializing the variable. Below is how to initialize in C :

   Int even[5] ={2,4,6,8,10};

   the size of the array is determined at the time of its creation or, initialization once it is done you cannot change the size of the array. Still if you try to assign value to the element of the array beyond its size a run time exception will be generated. It is possible to change the size of an existing array by reassigning it to the new one.

   References:

   - https://www.geeksforgeeks.org/arrays-in-c-cpp/

3. The output will be excess element in array initializer, this is occurred because there is no index out of bounds checking in C. In C, it is not a compiler error to initialize an array with more elements than the specified size.

   References:

   - https://www.tutorialspoint.com/cprogramming/c_arrays.htm

4. The array code :
    a) The difference between line 9 and line 11-16 is the name variable will be printed in string format while in line 11-16 the name variable will be printed using char format, so the program will be print the character from name variable one by one.
    b) Because in C programming language we don't have any data type as string. So in C programming language string is basically a character array. '\0' is the terminating character of a string, \0' (the null byte) and 0 are the same value, so your loop will stop when it encounters a 0. That's why its only iterate from 0 to 4.
    c) The programs may get error so when the users input the character larger than 5 character the size already exceed the size of array size, but nowadays the compiler can handle this kind of error

References:

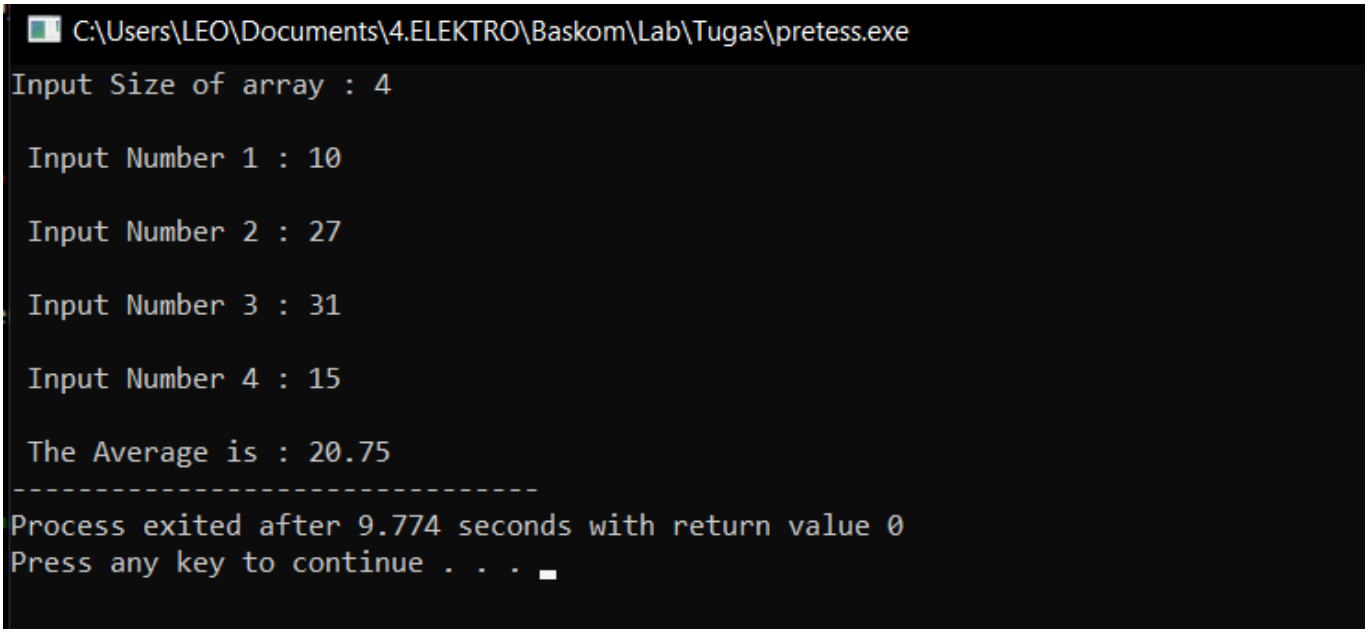
- https://www.geeksforgeeks.org/strings-in-c-2/

5. Below is the program :

```
#include<stdio.h>
int main(){
        int arraySize ,n, sum, index =1,i;
        float average;

        printf("Input Size of array : ");
        scanf("%d", &n);
        int array[n];

        int length = sizeof(array) / sizeof(array[0]);

        for(i=0 ; i < length ; i++){
                printf("\n Input Number %d : ", index);
                scanf("%d", &n);
                sum += n;
                index += 1;
```

```
        }
        average = (float)sum / (float)length ;
        printf("\n The Average is : %0.2f ", average);
}
```

THE OUTPUT :



References:

- https://www.w3schools.com/c/c_arrays.php