Activity No. 4.2	
Hands-on Activity 4.2: Arrays	
Course Code: CPE 007	**Program:** Computer Engineer
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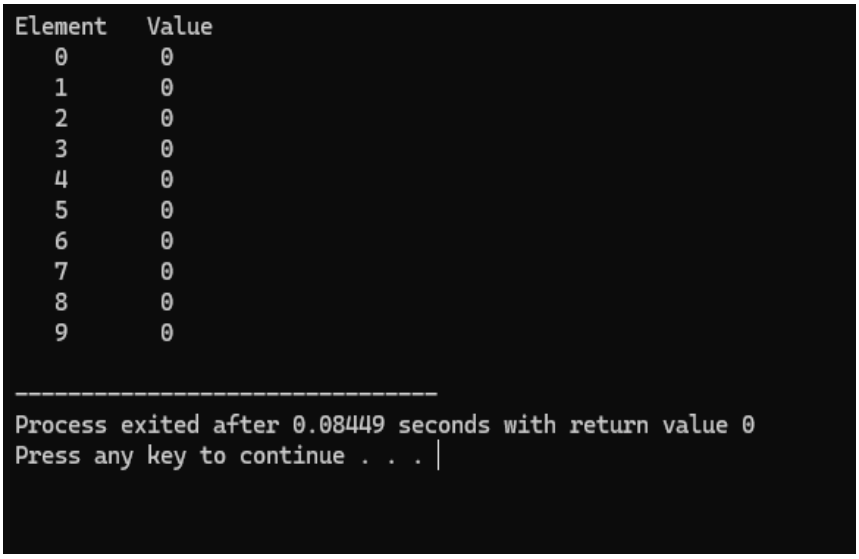
6. Output

Example of initializing an array:

Code :

```cpp
#include<iostream>
using namespace std;

#include <iostream>
using namespace std;

int main() {
    int n[10];

    // Initialize array elements to 0
    for (int i = 0; i < 10; i++) {
        n[i] = 0;
    }

    cout << "Element   Value" << endl;

    // Print index and value
    for (int i = 0; i < 10; i++) {
        cout << "    " << i << "       " << n[i] << endl;
    }

    return 0;
}
```

Output :



Explanation :

#include <iostream> just tells the program to include the input and output just like cout, cin, etc..
using namespace std; is for a shortcut for std::cout so you can type cout for convenience.

int main() { this is where the program runs, it's the main part of the program.
int n[10]; this is so the array n can store 10 integers or variables.

for (int i = 0; i < 10; i++) { so the program will run from i to 0 then it will chec**k if i is < 10** then will increase the increment by 1**.**
n[i] = 0; sets the array i to 0 after the loop finishes.
}

cout << "Element Value" << endl; add the text element value in the header of the output.

for (int i = 0; i < 10; i++) { for the loop to run again from 0 to 9.
cout << " " << i << " " << n[i] << endl; to add spaces prints the value of i, prints the value stored in n.

return 0; to tell if the program finished without errors.

Example of initializing an array with a declaration:

Code :

```cpp
#include <iostream>
using namespace std;

int main() {
    int n[10] = {32, 27, 64, 18, 95, 14, 90, 70, 60, 37};

    cout << "Element  Value" << endl;

    for (int i = 0; i < 10; i++) {
        cout << "    " << i << "       " << n[i] << endl;
    }

    return 0;
}
```

Output :

```
Element  Value
   0      32
   1      27
   2      64
   3      18
   4      95
   5      14
   6      90
   7      70
   8      60
   9      37

--------------------------------
Process exited after 0.01041 seconds with return value 0
Press any key to continue . . .
```

Explanation :

#include <iostream> just tells the program to include the input and output just like cout, cin, etc..

using namespace std; is for a shortcut for std::cout so you can type cout for convenience.

int main() { this is where the program runs, it's the main part of the program.

int n[10] = {32, 27, 64, 18, 95, 14, 90, 70, 60, 37}; so the program can declare the int n value as the number 32, 27, 64, 18, 95, 14, 90, 70, 60, 37.

cout << "Element Value" << endl; outputs the headers text as “Element Value”.

for (int i = 0; i < 10; i++) { so the program will run from i to 0 then it will check if i is < 10 then will increase the increment by 1.

cout << "   " << i << "   " << n[i] << endl; add spaces and then prints the value of the array i and n[i].
}

return 0; to tell if the program finished without errors.

Example of computing sum of elements of the array:

Code :

```cpp
#include <iostream>
using namespace std;

#define SIZE 12

int main() {
    int a[SIZE] = {1, 3, 5, 4, 7, 2, 99, 16, 45, 67, 89, 45};
    int total = 0;

    for (int i = 0; i < SIZE; i++) {
        total += a[i];
    }

    cout << "Total of array element values is " << total << endl;
    return 0;
}
```

Output :

```
Total of array element values is 383

--------------------------------
Process exited after 0.008007 seconds with return value 0
Press any key to continue . . .
```

Explanation :

#include <iostream> just tells the program to include the input and output just like cout, cin, etc..

using namespace std; is for a shortcut for std::cout so you can type cout for convenience.

#define SIZE 12 to make “SIZE” 12.

int main() { this is where the program runs, it's the main part of the program.

int a[SIZE] = {1, 3, 5, 4, 7, 2, 99, 16, 45, 67, 89, 45}; values a with the int a[0] = 1, a[1] = 3, a[2] = 5, etc…

int total = 0; the sum of all the value

for (int i = 0; i < SIZE; i++) { so the program will run 0 to 11.
total += a[i]; so the current total will be added to the current value.
}

cout << "Total of array element values is" << total << endl; for the output print "Total of array element values is".

return 0; to tell if the program finished without errors.

7. Supplementary Activity

1. **Given the size of an array which is 10, and the elements such as 19, 3, 15, 7, 11, 9, 13, 5, 17 and 1, create a program that will display the following output :**

Code :

```cpp
#include <iostream>
using namespace std;

int main() {
    int n[10] = {19, 3, 15, 7, 11, 9, 13, 5, 17, 1};
    int arraySize = 10;
    int element[arraySize];
    string histogram[arraySize];

    for (int i = 0; i < arraySize;i++){
        for (int h = 0; h < n[i];h++){
         histogram [i] = histogram [i] + "*";
    }   }



    cout << "Element\   Value\   Histogram" << endl;

    for (int i = 0; i < 10; i++) {
        cout << i << "         " << n[i] << " \t" << histogram[i] << endl;

     }

    return 0;
}
```

Output :

```
Element Value   Histogram
0       19      ********************
1       3       ***
2       15      ***************
3       7       *******
4       11      ***********
5       9       *********
6       13      *************
7       5       *****
8       17      *****************
9       1       *

--------------------------------
Process exited after 0.01393 seconds with return value 0
Press any key to continue . . .
```

Explanation :

#include <iostream> just tells the program to include the input and output just like cout, cin, etc..

using namespace std; is for a shortcut for std::cout so you can type cout for convenience.

int main() { this is where the program runs, it's the main part of the program.

int n[10] = {19, 3, 15, 7, 11, 9, 13, 5, 17, 1}; to n contain 10 numbers.
int arraySize = 10; to make arraySize value 10.
int element[arraySize]; to create the value of element with the same size as array size
string histogram[arraySize]; to create the value of histogram same as array.

for (int i = 0; j < arraySize;i++){ so the program will run 0 to 9.
for (int h = 0; h < n[i];h++){ runs as many times depending on the value of n.
histogram [i] = histogram [i] + "*"; so the value of histogram [i] will have "*" as many as the value of n[i].
} }

cout << "Element Value Histogram" << endl; prints the heading text.

for (int i = 0; i < 10; i++) { so the program will run 0 to 9.
cout << i << "\t" << n[i] << "\t" << histogram[i] << endl; prints the value of i and the "*" according to the value of histogram[i]

}

return 0; to tell if the program finished without errors.

2. **Given the following data, create a program that summarizes the number of each type. Use array responses for the 40 element array of student's responses. Such as *int responses[RESPONSE_SIZE] = { 1, 2, 6, 4, 8, 5, 9, 7,***

8, 10, 1, 6, 3, 8, 6, 10, 3, 8, 2, 7, 6, 5, 7, 6, 8, 6, 7, 5, 6, 6, 5, 6, 7, 5, 6, 4, 8, 6, 8, 10}.

Code :

```cpp
#include <iostream>
using namespace std;

int main() {
    int response_size = 40;
    int responses[40] = {1, 2, 6, 4, 8, 5, 9, 7, 8, 10, 1, 6, 3, 8, 6, 10, 3, 8, 2, 7, 6, 5, 7, 6, 8, 6, 7, 5, 6, 6, 5, 6, 7, 5, 6, 4, 8, 6, 8, 10};
    int frequency_size = 11;
    int frequency[10] = {0, 0, 0, 0, 0, 0, 0, 0, 0, 0};

    for (int i = 0; i < response_size; i++) {
        int responsenum = responses[i];
        frequency[responsenum-1]++;
    }

    cout << "Response Summary : \n";
    for (int i = 1; i < frequency_size; i++) {
        cout << "Response" << i << " : " << frequency[i-1] << " student" << endl;
    }


     return 0;
}

```

Output :

```
Response Summary :
Response1 : 2 student
Response2 : 2 student
Response3 : 2 student
Response4 : 2 student
Response5 : 5 student
Response6 : 11 student
Response7 : 5 student
Response8 : 7 student
Response9 : 1 student
Response10 : 3 student

--------------------------------
Process exited after 1.036 seconds with return value 0
Press any key to continue . . .
```

Explanation :

#include <iostream> just tells the program to include the input and output just like cout, cin, etc..

using namespace std; is for a shortcut for std::cout so you can type cout for convenience.

int main() { this is where the program runs, it's the main part of the program.

int response_size = 40; So set response_size value to 40
int responses[40] = {1, 2, 6, 4, 8, 5, 9, 7, 8, 10, 1, 6, 3, 8, 6, 10, 3, 8, 2, 7, 6, 5, 7, 6, 8, 6, 7, 5, 6, 6, 5, 6, 7, 5, 6, 4, 8, 6, 8, 10}; to make responses[40] have value.
int frequency_size = 11; to set frequency_size to 11
int frequency[10] = {0, 0, 0, 0, 0, 0, 0, 0, 0, 0}; to make frequency[10] have value.

for (int i = 0; i < response_size; i++) { so the program can run 0 to 39
int responsenum = responses[i]; takes current response value in responses.
Frequency[responsenum-1]++; to compile similar numbers from responses to frequency.
}

cout << "Response Summary : \n"; to print the heading text.
for (int i = 1; i < frequency_size; i++) { for it to run 0 to 10 because frequency is 11 and it should be greater than i.
cout << "Response" << i << ":\t" << frequency[i-1] << " student" << endl; for the program to print text response and spaces and print the value of frequency we got.
}

return 0; to tell if the program finished without errors.

8. Conclusion

- **In this activity I learned more and how to properly do array code and its use, to store multiple variables and how to loop them. I also explored Loop coding. It was hard to read at first but I watched Youtube for me to understand it more, I still dont understand it that much but I'm getting the hang of it and improving slowly. I also learned how to compile similar values of arrays. By practice and multiple tries, this activity really helped me understand the concept and properties of arrays.**

9. Assessment Rubric

Rubric for SO 7 (13)

Criteria	Ratings						Pts
SO 7 PI 1 IILO4 Utilize lifelong learning skills in pursuit of personal development and excellence in professional practice. threshold: 4.8 pts	6 pts Excellent | Educational interests and pursuits exist and flourish outside classroom requirements,knowledge and/or experiences are pursued independently and applies knowledge learned into practice	5 pts Good | Educational interests and pursuits exist and flourish outside classroom requirements,knowledge and/or experiences are pursued independently	4 pts Satisfactory | Look beyond classroom requirements, showing interest in pursuing knowledge independently	3 pts Unsatisfactory | Begins to look beyond classroom requirements, showing interest in pursuing knowledge independently	2 pts Poor | Relies on classroom instruction only	1 pts Very Poor | No initiative or interest in acquiring new knowledge	6 pts
SO 7 PI 2 IILO4 Utilize lifelong learning skills in pursuit of personal development and excellence in professional practice. threshold: 4.8 pts	6 pts Excellent | Completes an assigned task independently and practices continuous improvement	5 pts Good | Completes an assigned task without supervision or guidance	4 pts Satisfactory | Requires minimal guidance to complete an assigned task	3 pts Unsatisfactory | Requires detailed or step-by-step instructions to complete a task	2 pts Poor | Shows little interest to complete a task independently	1 pts Very Poor | No interest to complete a task independently	6 pts
SO 7 PI 3 IILO4 Utilize lifelong learning skills in pursuit of personal development and excellence in professional practice. threshold: 4.8 pts	6 pts Excellent | Synthesizes and integrates information from a variety of sources; formulates a clear and precise perspective; draws appropriate conclusions	5 pts Good | Evaluate information from a variety of sources; formulates a clear and precise perspective.	4 pts Satisfactory | Analyze information from a variety of sources; formulates a clear and precise perspective.	3 pts Unsatisfactory | Apply the gathered information to formulate the problem	2 pts Poor | Gather and summarized the information from a variety of sources but failed to formulate the problem	1 pts Very Poor | Gather information from a variety of sources	6 pts
SO 7 PI 4 IILO4 Utilize lifelong learning skills in pursuit of personal development and excellence in professional practice. threshold: 4.8 pts	6 pts Excellent | Ideas are combined in original and creative ways in line with the new and emerging technology trends to solve a problem or address an issue.	5 pts Good | Ideas are creative and adapt the new knowledge to solve a problem or address an issue	4 pts Satisfactory | Ideas are creative in solving a problem, or address an issue	3 pts Unsatisfactory | Shows some creative ways to solve the problem	2 pts Poor | Shows initiative and attempt to develop creative ideas to solve the problem	1 pts Very Poor | Ideas are copied or restated from the sources consulted	6 pts
							Total Points: 24