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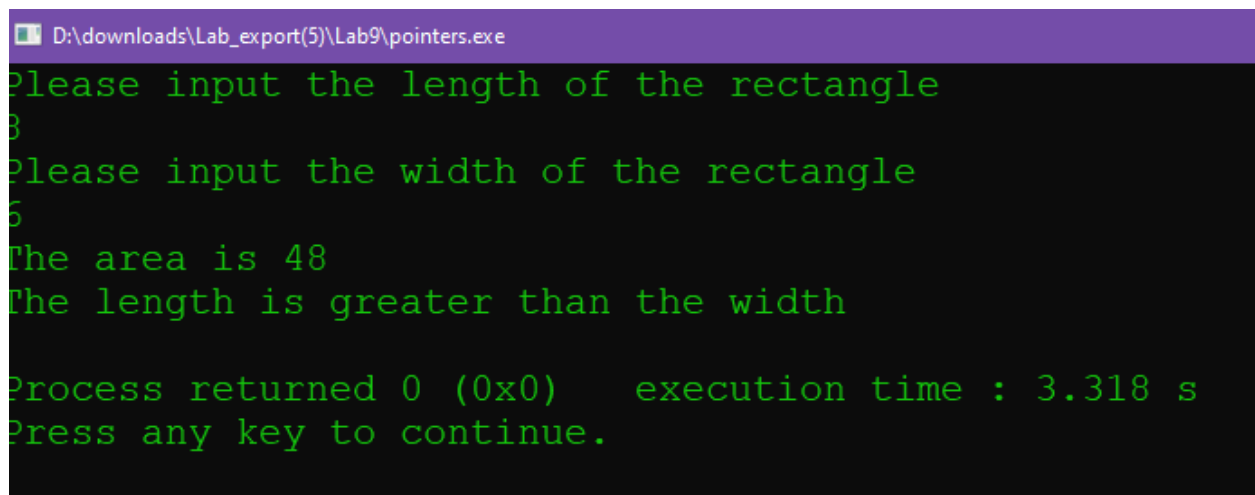
COSC 120

1 December 2020

Lab 9

9.1

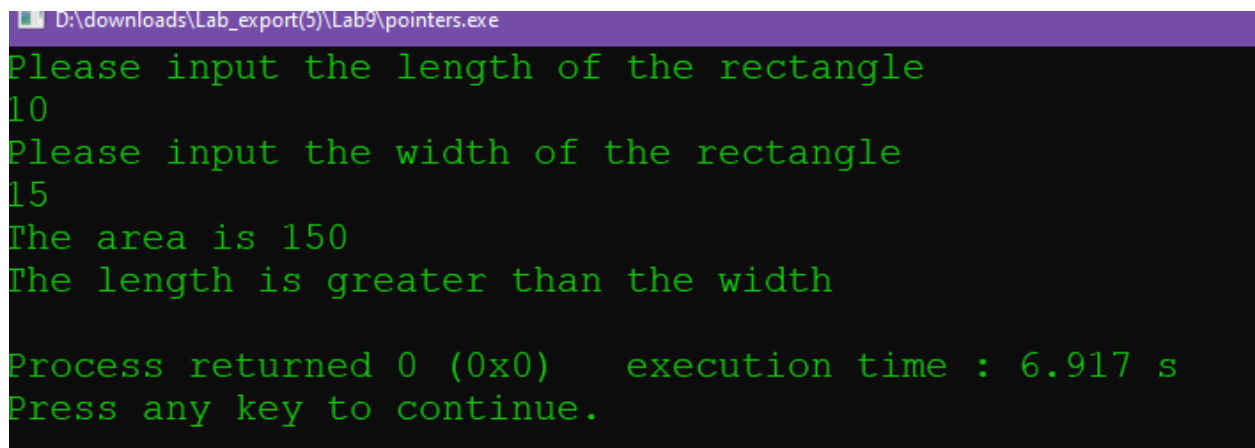
1.



```
D:\downloads\Lab_export(5)\Lab9\pointers.exe
Please input the length of the rectangle
8
Please input the width of the rectangle
6
The area is 48
The length is greater than the width

Process returned 0 (0x0)    execution time : 3.318 s
Press any key to continue.
```

2.



```
D:\downloads\Lab_export(5)\Lab9\pointers.exe
Please input the length of the rectangle
10
Please input the width of the rectangle
15
The area is 150
The length is greater than the width

Process returned 0 (0x0)    execution time : 6.917 s
Press any key to continue.
```

IT says that the length is greater than the width

Source Code:

```
// This program demonstrates the use of pointer variables
```

```
// It finds the area of a rectangle given length and width
```

```
// It prints the length and width in ascending order
```

```
// PLACE YOUR NAME HERE
```

```
#include <iostream>
```

```
using namespace std;
```

```
int main()
```

```
{
```

```
    int length; // holds length
```

```
    int width;  // holds width
```

```
    int area;   // holds area
```

```
    int *lengthPtr = nullptr; // int pointer which will be set to point to length
```

```
    int *widthPtr = nullptr;  // int pointer which will be set to point to width
```

```
    cout << "Please input the length of the rectangle" << endl;
```

```
    cin >> length;
```

```
    cout << "Please input the width of the rectangle" << endl;
```

```
cin >> width;
```

```
// Fill in code to make lengthPtr point to length (hold its address)
```

```
lengthPtr=&length;
```

```
// Fill in code to make widthPtr point to width (hold its address)
```

```
widthPtr=&width;
```

```
area=(*lengthPtr)*(*widthPtr); // Fill in code to find the area by using only the pointer  
variables
```

```
cout << "The area is " << area << endl;
```

```
if (lengthPtr>widthPtr)
```

```
{
```

```
    // Fill in the condition length > width by using only the pointer variables)
```

```
    cout << "The length is greater than the width" << endl;
```

```
}
```

```
else if (widthPtr>lengthPtr)
```

```
{
```

```
    // Fill in the condition of width > length by using only the pointer variables)
```

```
    cout << "The width is greater than the length" << endl;
```

```
}
```

```

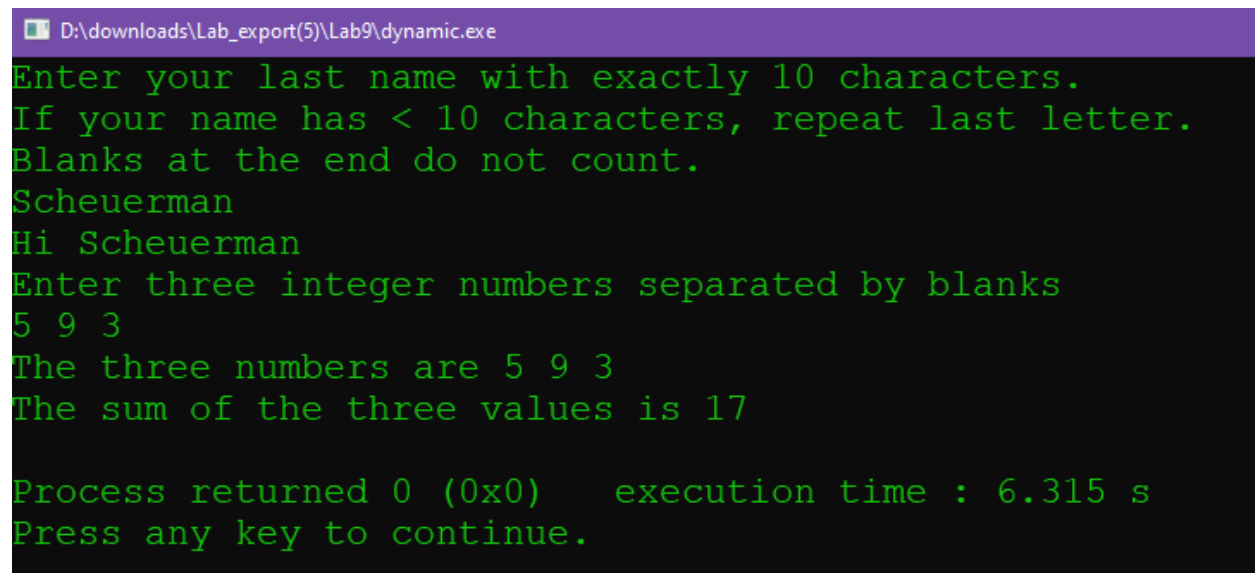
else
{
    cout << "The width and length are the same" << endl;
}

return 0;
}

```

9.2

1.



```

D:\downloads\Lab_export(5)\Lab9\dynamic.exe
Enter your last name with exactly 10 characters.
If your name has < 10 characters, repeat last letter.
Blanks at the end do not count.
Scheuerman
Hi Scheuerman
Enter three integer numbers separated by blanks
5 9 3
The three numbers are 5 9 3
The sum of the three values is 17

Process returned 0 (0x0)    execution time : 6.315 s
Press any key to continue.

```

2. cin I think it would not work because of the way the pointer is set up

Cout I also think it would not work because of the way the pointer is setup

-I was incorrect and the program ran normally

Source Code:

```
// This program demonstrates the use of dynamic variables
```

```
// PLACE YOUR NAME HERE
```

```
#include <iostream>
```

```
using namespace std;
```

```
const int MAXNAME = 10;
```

```
int main()
```

```
{
```

```
    int pos;
```

```
    char *name = nullptr;
```

```
    int *one = nullptr;
```

```
    int *two = nullptr;
```

```
    int *three = nullptr;
```

```
    int result;
```

```
    //      Fill in code to allocate the integer variable one here
```

```
    one=new int;
```

```
    //      Fill in code to allocate the integer variable two here
```

```
    two=new int;
```

```
    //      Fill in code to allocate the integer variable three here
```

```
    three=new int;
```

```

//      Fill in code to allocate the character array pointed to by name

name =new char[10]

;

cout << "Enter your last name with exactly 10 characters." << endl;

cout << "If your name has < 10 characters, repeat last letter. " << endl

    << "Blanks at the end do not count." << endl;

for (pos = 0; pos < MAXNAME; pos++)

    cin >>*(name+pos); // Fill in code to read a character into the name array

                        // WITHOUT USING a bracketed subscript

cout << "Hi ";

for (pos = 0; pos < MAXNAME; pos++)

    cout <<*(name+pos); // Fill in code to a print a character from the name array

                        // WITHOUT USING a bracketed subscript

cout << endl << "Enter three integer numbers separated by blanks" << endl;

// Fill in code to input three numbers and store them in the

cin>>*one;

cin>>*two;

```

```

cin>>*three;

// dynamic variables pointed to by pointers one, two, and three.

// You are working only with pointer variables


// echo print

cout << "The three numbers are " <<*one <<" "<<*two<<" "<<*three<< endl;


// Fill in code to output those numbers


result =(*one+*two+*three); // Fill in code to calculate the sum of the three numbers


cout << "The sum of the three values is " << result << endl;

delete one;

delete two;

delete three;

delete name;


// Fill in code to deallocate one, two, three and name


return 0;

}

```

9.3

1.

```
D:\downloads\Lab_export(5)\Lab9\darray.exe
How many monthly sales will be processed? 5
Enter the sales below
Sales for Month number 1:345
Sales for Month number 2:765
Sales for Month number 3:456
Sales for Month number 4:345
Sales for Month number 5:432
345.00
765.00
456.00
345.00
432.00
Average Monthly sale is $468.60

Process returned 0 (0x0)    execution time : 10.136 s
Press any key to continue.
```

```
D:\downloads\Lab_export(5)\Lab9\darray.exe
How many monthly sales will be processed? 3
Enter the sales below
Sales for Month number 1:401.25
Sales for Month number 2:352.89
Sales for Month number 3:375.05
401.25
352.89
375.05
Average Monthly sale is $376.40

Process returned 0 (0x0)    execution time : 18.473 s
Press any key to continue.
```

Source Code

```
// This program demonstrates the use of dynamic arrays
```

```
// PLACE YOUR NAME HERE
```



```
#include <iostream>

#include <iomanip>

using namespace std;

int main()

{

    float *monthSales = nullptr;    // a pointer used to point to an array
    // holding monthly sales

    float total = 0;    // total of all sales

    float average;    // average of monthly sales

    int numOfSales;    // number of sales to be processed

    int count;    // loop counter

    cout << fixed << showpoint << setprecision(2);

    cout << "How many monthly sales will be processed? ";

    cin >> numOfSales;

    // Fill in the code to allocate memory for the array pointed to by
    // monthSales.

    monthSales = new float[numOfSales];
```

```

if (monthSales==nullptr)
{
    cout << "Error allocating memory!\n";
    return 1;
}

// Fill in the condition to determine if memory has been
// allocated (or eliminate this if construct if your instructor
// tells you it is not needed for your compiler) )

cout << "Enter the sales below\n";

for (count = 0; count < numOfSales; count++)
{
    cout << "Sales for Month number      "
        << count+1// Fill in code to show the number of the month
        << ":\n";

    cin>>(monthSales[count]);

    // Fill in code to bring sales into an element of the array
}

for (count = 0; count < numOfSales; count++)

```

```

{
    cout<<monthSales[count]<<endl;

    total = total + monthSales[count];
}

```

average = total/numOfSales;// Fill in code to find the average

```
cout << "Average Monthly sale is $" <<fixed<<setprecision(2)<< average << endl;
```

// Fill in the code to deallocate memory assigned to the array.

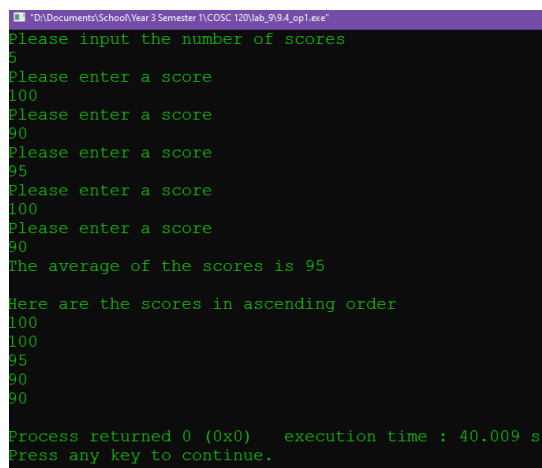
```
delete []monthSales;
```

```
return 0;
```

```
}
```

9.4

Option 1



```

D:\Documents\School\Year 3 Semester 1\COSC 120\lab_9\9.4_ep1.exe
Please input the number of scores
5
Please enter a score
100
Please enter a score
90
Please enter a score
95
Please enter a score
100
Please enter a score
90
The average of the scores is 95
Here are the scores in ascending order
100
100
95
90
90
Process returned 0 (0x0)   execution time : 40.009 s
Press any key to continue.

```

```
"D:\Documents\School\Year 3 Semester 1\COSC 120\lab_9\9.4_op1.exe"
Please input the number of scores
7
Please enter a score
564
Please enter a score
33
Please enter a score
77
Please enter a score
55
Please enter a score
64
Please enter a score
37
Please enter a score
66
The average of the scores is 128

Here are the scores in ascending order
564
77
66
64
55
37
33

Process returned 0 (0x0)   execution time : 9.792 s
Press any key to continue.
```

Source Code

```
#include <iostream>

using namespace std;

void sort(float* score, int num_scores)
{
    //bubble sort to sort in ascending order

    for (int i = 0; i < num_scores-1; i++)
    {
        for (int j = 0; j < num_scores-i-1; j++)
        {
            if (score[j] < score[j+1])
            {
                swap(score[j], score[j+1]);

                //perform swap
            }
        }
    }
}
```

```

    }

}

cout<<"Here are the scores in ascending order"<<endl;

for (int i=0; i<num_scores; i++)

{

    //print swapped scores

    cout<<score[i]<<endl;

}

}

```

```

int main()

{

    float *score = nullptr;

    int num_scores=0;

    int total=0;

    int avg=0;

    // a pointer variable

    cout<<"Please input the number of scores"<<endl;

    cin>>num_scores;

    score =new float[num_scores];

    for (int i=0; i<num_scores; i++)

    {

        cout<<"Please enter a score"<<endl;

```

```

        cin>>score[i];

        total+=score[i];

    }

    avg=total/num_scores;

    cout<<"The average of the scores is "<<avg<<endl<<endl;

    sort(score,num_scores);

    // allocation of the array sort(score,scoreSize); // call to the function

    delete []score;

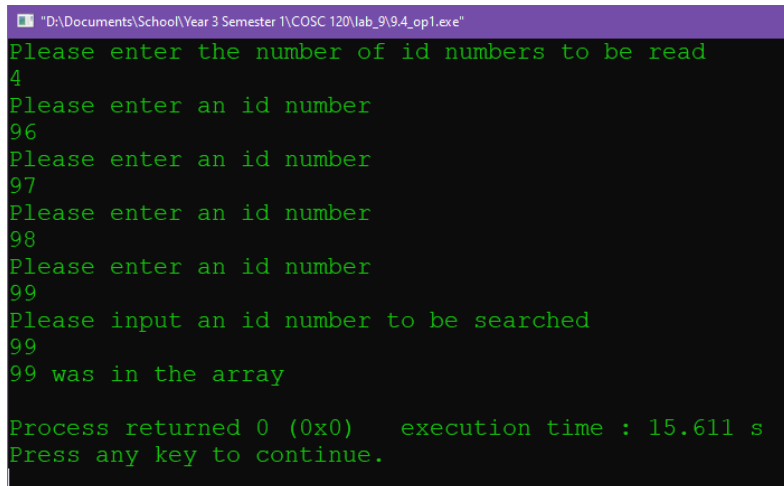
    //deallocate

    return 0;

}

```

Option 2



The screenshot shows a terminal window with the following text:

```

"D:\Documents\School\Year 3 Semester 1\COSC 120\lab_9\9.4_op1.exe"
Please enter the number of id numbers to be read
4
Please enter an id number
96
Please enter an id number
97
Please enter an id number
98
Please enter an id number
99
Please input an id number to be searched
99
99 was in the array

Process returned 0 (0x0)   execution time : 15.611 s
Press any key to continue.

```

```
"D:\Documents\School\Year 3 Semester 1\COSC 120\lab_9\9.4_op1.exe"
Please enter the number of id numbers to be read
4
Please enter an id number
96
Please enter an id number
97
Please enter an id number
98
Please enter an id number
99
Please input an id number to be searched
76
76 was not in the array

Process returned 0 (0x0)   execution time : 6.351 s
Press any key to continue.
```

Source Code

```
#include <iostream>

using namespace std;

int main()
{
    int* ids=nullptr;

    //define Ptr

    int id_amnt;

    int id_search;

    bool in_array;

    //initialize

    cout<<"Please enter the number of id numbers to be read"<<endl;

    cin>>id_amnt;

    ids =new int [id_amnt];
```

```
for (int i=0; i<id_amnt; i++)

    //populate array

{

    cout<<"Please enter an id number"<<endl;

    cin>>ids[i];

}

cout<<"Please input an id number to be searched"<<endl;

cin>>id_search;

for(int i=0; i<<id_amnt; i++)

    //perform id search

{

    if (ids[i]==id_search)

    {

        in_array=true;

        break;

    }

    else

    {

        in_array=false;

    }

}

if (in_array==true)

{
```



```

        cout<<id_search<<" was in the array"<<endl;
    }
else
{
    cout<<id_search<<" was not in the array"<<endl;
}

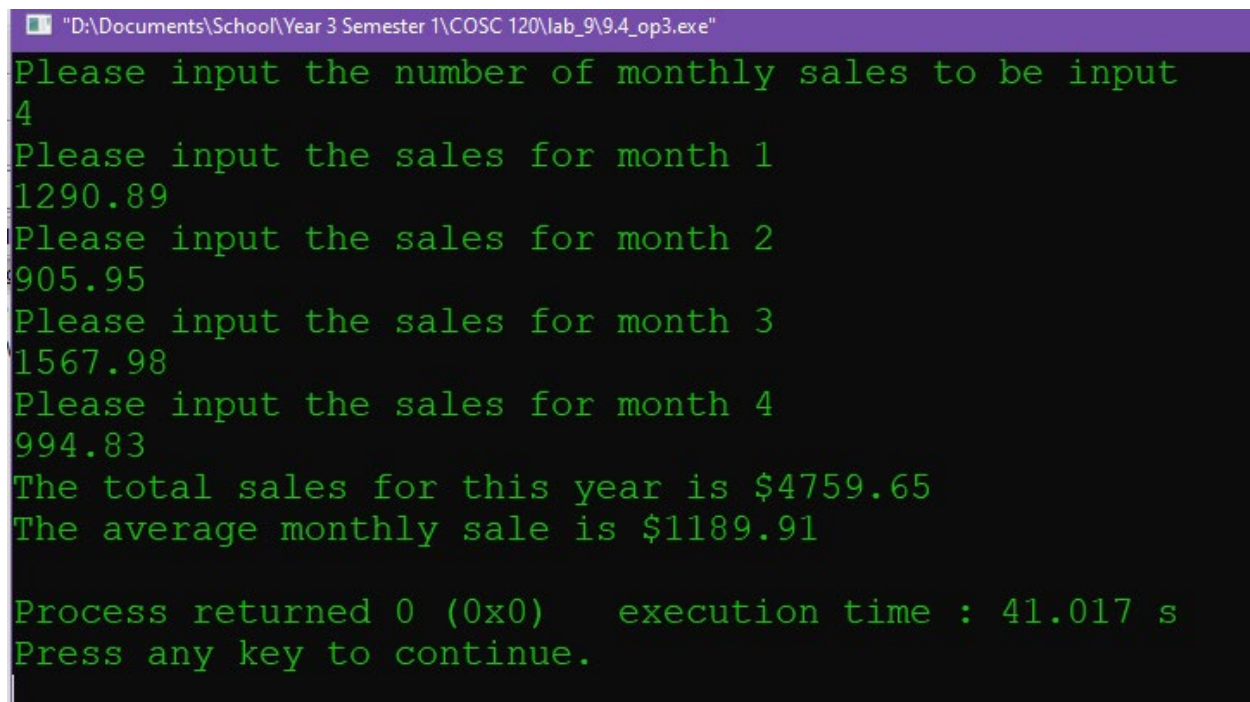
delete [] ids;

//deallocate

return 0;
}

```

Option 3



```

"D:\Documents\School\Year 3 Semester 1\COSC 120\lab_9\9.4_op3.exe"
Please input the number of monthly sales to be input
4
Please input the sales for month 1
1290.89
Please input the sales for month 2
905.95
Please input the sales for month 3
1567.98
Please input the sales for month 4
994.83
The total sales for this year is $4759.65
The average monthly sale is $1189.91

Process returned 0 (0x0)    execution time : 41.017 s
Press any key to continue.

```

```
"D:\Documents\School\Year 3 Semester 1\COSC 120\lab_9\9.4_op3.exe"
Please input the number of monthly sales to be input
5
Please input the sales for month 1
567.83
Please input the sales for month 2
453.87
Please input the sales for month 3
988.67
Please input the sales for month 4
1509.67
Please input the sales for month 5
1398.34
The total sales for this year is $4918.38
The average monthly sale is $983.68

Process returned 0 (0x0)    execution time : 40.252 s
Press any key to continue.
```

Source Code:

```
#include <iostream>

#include <iomanip>

using namespace std;

float get_avg(float *sales_arr,int arr_size);

float get_total(float *sales_arr,int arr_size);

float get_avg(float *sales_arr,int arr_size)
{
    //function to calculate average with dynamic array

    float total=0;

    float avg=0;

    for (int i=0; i<arr_size; i++)
```

```

    {
        total+=sales_arr[i];
    }

    avg=total/arr_size;

    //calculate and return

    return avg;
}

float get_total(float *sales_arr,int arr_size)

{
    //function to calculate average with dynamic array

    float total=0;

    for (int i=0; i<arr_size; i++)

    {
        total+=sales_arr[i];
    }

    //calculate and return

    return total;
}

int main()

{
    int months=0;

    float *Ptr=NULLptr;

    float total=0;

```

```
float avg=0;

//initialize

cout<<"Please input the number of monthly sales to be input "<<endl;

cin>>months;

Ptr=new float[months];

//allocate

for (int i=0; i<months; i++)

{

    //populate array

    cout<<"Please input the sales for month "<<i+1<<endl;

    cin>>Ptr[i];

}

avg=get_avg(Ptr,months);

total=get_total(Ptr,months);

//get avg and total

cout<<"The total sales for this year is $"<<fixed<<setprecision(2)<<total<<endl;

cout<<"The average monthly sale is $"<<fixed<<setprecision(2)<<avg<<endl;

delete [] Ptr;

//deallocate memory
```

```
return 0;
```

```
}
```