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COSC 120-751

01/25/2021

Lab 8

Lab 8.1

Source Code:

```
#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;

        lengthPtr = &length;
        widthPtr = &width;
```

```
    area = *lengthPtr * *widthPtr;

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

    if (*lengthPtr > *widthPtr)
        cout << "The length is greater than the width" << endl;

    else if (*widthPtr > *lengthPtr)
        cout << "The width is greater than the length" << endl;

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

    return 0;
}
```

Question Answer:

Exercise 1: Wanted to complete the program filling in the pointer variables and reference and dereference operators, & and *.

Exercise 2: Wanted to run the program with input 10 and 15. The output is:

Please input the length of the rectangle

10

Please input the width of the rectangle

15

The area is 150

The width is greater than the length

Lab 8.2

Source Code:

```
//Nick Krisulevicz
//Lab 8.2
//01/25/2021

#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;

	one = new int;
	two = new int;
	three = new int;
	name = new char [MAXNAME];

	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);
}

        cout << "Hi ";

        for (pos = 0; pos < MAXNAME; pos++)
{
                cout << *(name + pos);
}

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

        cin >> *one >> *two >> *three;

        cout << "The three numbers are " << endl;

        cout << *one << " " << *two << " " << *three << endl;

        result = *one + *two + *three;

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

        delete one;
        delete two;
        delete three;
        delete name;
```

```
    return 0;
}
```

Question Answer:

Exercise 1: wanted to complete the code.

Exercise 2: wanted us to run the program without the bracket subscript for the name array. The output is :

Enter your last name with exactly 10 characters.

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

Blanks at the end do not count.

nickkkkkkk

Hi nickkkkkkk

Enter three integer numbers separated by blanks

14 16 18

The three numbers are

14 16 18

The sum of the three values is 48

Exercise 2 also wanted to know why the bracket subscripts were not necessary. This is because of the array name and offset arithmetic method. You could implement the square bracket subscript method for both inputting and outputting the name, and they would work just the same

---

Lab 8.3

Source Code:

```
//Nick Krisulevicz
//Lab 8.3
//01/25/2021

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

```
int main()
{
	float *monthSales = nullptr;

	float total = 0;
	float average;
	int numOfSales;
	int count;

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

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

	monthSales = new float[numOfSales];

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

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

	for (count = 0; count < numOfSales; count++)
	{
		cout << "Sales for Month number           "
		    << count + 1
```

```
                        << ":";
    cin >> *(monthSales + count);
        }

        for (count = 0; count < numOfSales; count++)
        {
                total = total + monthSales[count];
        }

        average = total / numOfSales;

        cout << "Average Monthly sale is $" << average << endl;

        delete [] monthSales;

        return 0;
}
```

Question Answer:

Exercise 1: Wanted to complete and run the program. The output is as follows.

How many monthly sales will be processed? 3

Enter the sales below

Sales for Month number 1:117.21

Sales for Month number 2:181.88

Sales for Month number 3:1337.24

Average Monthly sale is $545.44

Lab 8.4.1

Source Code:

```
//Nick Krisulevicz
//Lab 8.4.1
```

```
//01/25/2021

#include <iostream>
using namespace std;

void swapnum(int &a, int&b);
void bubblesort(int array[], int size);



int main()
{
   int *numofgrades = nullptr;
   int *grades = nullptr;
   int *total = nullptr;
   double *average = nullptr;
   int pos;

   numofgrades = new int;

   cout << "Enter the amount of grades:";
   cin >> *numofgrades;
   cout << endl;

   grades = new int[*numofgrades];
   total = new int;
   average = new double;

   *total = 0;
```

```
    for(pos = 0; pos < *numofgrades; pos++)
    {
        cout << "Enter a grade" << endl;
        cin >> *(grades + pos);
        *total += *grades;
        cout << endl;
    }

    *average = *total / *numofgrades;
    bubblesort(grades, *numofgrades);

    cout << "Average grade is: " << *average << endl;
    cout << "Here are the grades in ascending order:" << endl;

    for(pos = 0; pos < *numofgrades; pos++)
    {
        cout << *(grades + pos) << endl;
    }

    delete numofgrades;
    delete grades;
    delete total;
    delete average;

    return 0;
}


void swapnum(int &a, int &b)
```

```
{
   int temp = a;
   a = b;
   b = temp;
}



void bubblesort(int numarray[], int numsize)
{
   int maxelement;
   int index;
   for(maxelement = numsize - 1; maxelement > 0; maxelement--)
   {
      for(index = 0; index < maxelement; index++)
      {
         if(numarray[index] > numarray[index + 1])
         {
            swapnum(numarray[index], numarray[index + 1]);
         }
      }
   }
}
```

Output:

```
Enter the amount of grades:5


Enter a grade
100
```

Enter a grade

80

Enter a grade

60

Enter a grade

80

Enter a grade

100

Average grade is: 100

Here are the grades in ascending order:

60

80

80

100

100

Lab 8.4.2

Source Code:

```
//Nick Krisulevicz
//Lab 8.4.2
//01/25/2021

#include <iostream>
using namespace std;

int main()
```

```
{
   int *numofids = nullptr;
   int *id = nullptr;
   int *searchnum = nullptr;
   int *checker = nullptr;
   int pos;

   numofids = new int;

   cout << "Enter the amount of id's to be read:" << endl;
   cin >> *numofids;

   id = new int[*numofids];
   searchnum = new int;
   checker = new int;

   for(pos = 0; pos < *numofids; pos++)
   {
      cout << "Enter an id number:";
      cin >> *(id + pos);
      cout << endl;
   }

   cout << "Here are the id numbers you entered:" << endl;

   for(pos = 0; pos < *numofids; pos++)
   {
      cout << *(id + pos) << endl;
   }
```

```
    cout << "Enter an id number to search:";
    cin >> *searchnum;
    for(pos = 0; pos < *numofids; pos++)
    {
       if(*(id + pos) == *searchnum)
       {
          *checker = 1;
       }
       else
       {
          *checker = 0;
       }
    }
    if(*checker == 1)
    {
       cout << "The number you searched is in the array." << endl;
    }
    else if(*checker == 0)
    {
       cout << "The number you searched is not in the array." << endl;
    }
    else
    {
       cout << "Invalid input." << endl;
    }

    return 0;
}
```

Output:

Enter the amount of id's to be read:

3

Enter an id number:67

Enter an id number:72

Enter an id number:85

Here are the id numbers you entered:

67

72

85

Enter an id number to search:85

The number you searched is in the array.

Lab 8.4.3

Source Code:

```
//Nick Krisulevicz
//Lab 8.4.3
//01/25/2021

#include <iostream>
#include <iomanip>
using namespace std;

double yearlysum(double array[], int size);
double yearlyavg(double array[], int size);

int main()
```

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

   int *numofsales = nullptr;
   double *sales = nullptr;
   int pos;

   numofsales = new int;

   cout << "Please enter the number of monthly sales for this year.";
   cin >> *numofsales;
   cout << endl;

   sales = new double;

   for(pos = 0; pos < *numofsales; pos++)
   {
      cout << "Day " << (pos + 1) << ": $";
      cin >> *(sales + pos);
      cout << endl;
   }

   for(pos = 0; pos < *numofsales; pos++)
   {
      cout << "Day " << (pos + 1) << ": $" << *(sales + pos) << endl;
   }

   cout << "Yearly total sales is: $" << yearlysum(sales, *numofsales) << endl;
   cout << "Yearly average sales are: $" << yearlyavg(sales, *numofsales) << endl;
```

```
    return 0;
}

double yearlysum(double array[], int size)
{
    double total;
    for(int i = 0; i < size; i++)
    {
        total += array[i];
    }
    return total;
}

double yearlyavg(double array[], int size)
{
    double total;
    for(int j = 0; j < size; j++)
    {
        total += array[j];
    }
    double average = total / size;
    return average;
}
```

Output:

Please enter the number of monthly sales for this year.3

Day 1: $1337.77

Day 2: $141.44

Day 3: $9988.26

Day 1: $1337.77

Day 2: $141.44

Day 3: $9988.26

Yearly total sales is: $11467.47

Yearly average sales are: $3822.49