**ITCS 1212L**

**Post-Lab 9**

**1: (30 points) Area of a Rectangle**

Write a program to calculate the area of a rectangle and display it. Your main() function should call the following functions:

* getLength() – This function should ask the user to enter the rectangle’s length, and then return that value as a double.
* getWidth() – This function should ask the user to enter the rectangle’s width, and then return that value as a double
* getArea() – This function should accept the rectangle’s length and width as parameters, and returns the rectangle’s area.
* displayData() – This function should accept the rectangle’s length, width and area as parameters, and display them in an appropriate message on the screen.

#include <iostream>

#include <fstream>

using namespace std;

double getLength();

double getWidth();

double getArea(double, double);

void displayData(double, double, double);

int main()

{

cout << endl << endl;

double length(0), width(0), area(0);

length = getLength();

width = getWidth();

area = getArea(length, width);

displayData(length, width, area);

cout << endl << endl;

return 0;

}

double getLength()

{

double length(0);

cout << "Please enter the length of your rectangle: ";

cin >> length;

cout << endl;

return length;

}

double getWidth()

{

double width(0);

cout << "Please enter the width of your rectangle: ";

cin >> width;

cout << endl << endl;

return width;

}

double getArea(double length, double width)

{

double area(0);

area = length \* width;

return area;

}

void displayData(double length, double width, double area)

{

cout << "Your length was: " << length << "." << endl;

cout << "Your width was: " << width << "." << endl;

cout << "The rectangle's area is: " << area << "." << endl;

}

**2: (30 points) Area of Several Rectangles**

Create and array of type double which holds the area of up-to 5 rectangles. Use the code from postlab 1 to get the length and width for each rectangle and eventually calculate the area of rectangle and store it in the array.

#include <iostream>

#include <fstream>

using namespace std;

double getLength(int);

double getWidth(int);

void getArea(double, double, int, double\*);

void displayData(double, double, double\*, int);

const int SIZE = 5;

int main()

{

cout << endl << endl;

double length(0), width(0), area(0);

double rectangleArray[SIZE];

int i(0);

for (i = 0; i < SIZE; i++)

{

length = getLength(i);

width = getWidth(i);

getArea(length, width, i, rectangleArray);

}

displayData(length, width, rectangleArray, SIZE);

cout << endl << endl;

return 0;

}

double getLength(int index)

{

double length(0);

cout << "Please enter the length of rectangle #" << index+1 << ": ";

cin >> length;

cout << endl;

return length;

}

double getWidth(int index)

{

double width(0);

cout << "Please enter the width of rectangle #" << index+1 << ": ";

cin >> width;

cout << endl << endl;

return width;

}

void getArea(double length, double width, int index, double rectangleArray[])

{

double area(0);

area = length \* width;

rectangleArray[index] = area;

}

void displayData(double length, double width, double rectangleArray[], int SIZE)

{

for (int i(0); i < SIZE; i++)

{

cout << "-----------------------------------------------" << endl;

cout << "Rectangle " << i+1 << "!" << endl;

cout << "The rectangle's area is: " << rectangleArray[i] << "!" << endl;

cout << "-----------------------------------------------" << endl << endl;

}

cout << endl;

}

**3: (40 points) Lowest Score Drop**

Write a program that gets the scores of several tests and stores them in an array. Then, it calculates the average of the test score by first dropping the lowest score in the group. It should use the following functions:

* void getScore() should accept 4 test scores from the user, store the test scores in an array, and validate them. This function should be called once by your main() function.
* void calcAverage() should calculate and display the average of the three highest scores. This function should only be called once by main(), and should be passed the array which holds the four test scores.
* int findLowest() should find and return the lowest of the four test scores passed to it. This function should be called by calcAverage(), which uses the function to determine which of the four test scores to drop.

*Input Validation: Do not accept test scores lower than 0 or higher than 100*

**#include <iostream>**

**#include <fstream>**

**using namespace std;**

**void getScore(int\*);**

**void calcAverage(int\*);**

**int findLowest(int\*);**

**const int SIZE = 4;**

**int main()**

**{**

**cout << endl << endl;**

**int testScores[SIZE];**

**getScore(testScores);**

**calcAverage(testScores);**

**return 0;**

**}**

**void getScore(int testScores[])**

**{**

**int score(-1);**

**for (int i = 0; i < SIZE; i++)**

**{**

**while (score < 0 || score > 100)**

**{**

**cout << "Please enter the score for test #" << i+1 << ": ";**

**cin >> score;**

**cout << endl << endl;**

**if (score < 0 || score > 100)**

**{**

**cout << "You must enter a value between 1-100!" << endl << endl;**

**}**

**}**

**testScores[i] = score;**

**score = -1;**

**}**

**}**

**void calcAverage(int testScores[])**

**{**

**int lowest(0), runningTotal(0), average(0);**

**lowest = findLowest(testScores);**

**for (int i = 0; i < SIZE; i++)**

**{**

**runningTotal += testScores[i];**

**}**

**runningTotal -= testScores[lowest];**

**average = runningTotal / (SIZE - 1);**

**cout << "Your test average (dropping the lowest) is: " << average << "!" << endl;**

**}**

**int findLowest(int testScores[])**

**{**

**int lowest(0), lowestValueHolder(0);**

**lowestValueHolder = testScores[0];**

**for (int i = 0; i < SIZE; i++)**

**{**

**if (testScores[i] < lowestValueHolder)**

**{**

**lowest = i;**

**}**

**}**

**return lowest;**

**}**