Alexander J King

Homework #8

Comparative Programming Languages

Homework 7

1) Create programs in C++ or C#, Python and Visual Basic which perform each of the following: Explain the different design choices (syntax) for option in each language Document the programs using Flowcharts Each programs source code must be included – label each with the language used

a) Nested two-way selection statements

b) Multiple-way selection statement

c) Iterative Statements – Counter controlled and Logic controlled

d) After the Counter Controlled Iterative successfully completes – Display “This was a success” on the screen.

**CODE**

using System;

namespace ConsoleApp7

{

class Program

{

static void Main(string[] args)

{

Console.WriteLine("Do you want to make a matrix of 'Hello World 's or \*'s?");

Console.WriteLine("Press 1 for Hello Worlds and 2 for stars: "); // Would you like the out to be a matrix of stars < \* > or Hello Worlds?

int helloStars = int.Parse(Console.ReadLine());

if (helloStars == 1 || helloStars == 2) // did you give me a valid input?

{ // ask for rows and columns AFTER we confirm you gavea correct previous input.

Console.WriteLine("How rows would you like?"); // # of rows OUTER LOOP!

int rows = int.Parse(Console.ReadLine());

Console.WriteLine("How many columns would you like?"); // # of columns INNER LOOP!

int columns = int.Parse(Console.ReadLine());

if (helloStars == 2)

{

for (int ii = 0; ii < rows; ii++)

{

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

{

Console.Write("\* ");

}

Console.WriteLine();

}

}

else if (helloStars == 1)

{

for (int ii = 0; ii < rows; ii++)

{

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

{

Console.Write("Hello World ");

}

Console.WriteLine();

}

}

Console.WriteLine("This was a success!"); // required 'this was a sucess' statement for sucessful run.

}

else {

Console.WriteLine("Invalid input please select 1 or 2......."); // invalid input end program

Console.WriteLine("This was NOT a success. ID-10-T ERROR! Please try again."); // NOT success. Error code ID10T for lols.

}

}

}

}

2) Explain (in your own words) each of the following, give design issues and give an example of each: a) Control Statement In my program I used several control statements. The first is an if statement checking if you provided a valid input if you wanted a martix of Hello Worlds or stars <\*>. If you did not provide a valid input then the program ends if you did it continues to ask you how many rows and columns you would like in your matrix that are then iterated by a 4 statement with your user input as a variable to determine the number of iterations.

b) Control Structure

The control structure in my program requires valid inputs to get to the next section(s) and directs which loop(s) the program should continue towards. For example you have to select if you want Hello Worlds or stars and they lead to different for loops.

c) Selection Statement

i) Two way selectors You can pick between two options for the matrix to be made of. Hello Words and stars \* .

ii) Multi way selectors You can pick any size matrix for the columns and rows.

d) Nesting selectors IF

if (helloStars == 1 || helloStars == 2) // did you give me a valid input?

{

all the things

} else {

Console.WriteLine("Invalid input please select 1 or 2......."); // invalid input end program

Console.WriteLine("This was NOT a success. ID-10-T ERROR! Please try again."); // NOT success. Error code ID10T for lols.

}

e) Selector Expressions

If the if expression returns a value, there must be an else clause (the expression could produce output, rather than a value)

This is covered in various else / else if statements.

f) Multi-way Selection statements

Allow the selection of one of any number of statements or statement groups

You could technically give a negative number for the matrix size and break it. (it claims success). But the better example of the multi-way selector is you can input any int number and select from any size matrix you please.

g) Iterative Statement

i) Counter Controlled How many columns and rows is set by an iterative for statement using the users input for a variable.

ii) Logic Controlled Fail out before asking for column and row size based on logic.

if (helloStars == 1 || helloStars == 2) // did you give me a valid input? And then again individually for helloStars ==1 and ==2.

h) Iteration based on data structures

Could iterated based on data types like int, string etc. I do not iterate BY data type in my program as the outputs are both strings.

i) Unconditional Branching How each section of the program makes it to the next section. This way it does not bug out and get stuck in a section of the program every bit ends and goes to another section or exits the program.

3) What did Bohm and Jocopini prove about flow charts?

The Bohm-Jacopini proof describes how to construct a structured flow chart from an arbitrary chart, using the bits in an extra integer variable to keep track of information that the original program represents by the program location.

4) What is a flow chart and why do we use them in programming?

A diagram to describe the programs functionality. This allows for early troubleshooting and planning before coding for possible issues.

5) Explain the following flow chart symbols and give the actual symbol for each:

a) Terminator - a rounded rectangle circular on either end and flat through the middle. Used to indicate the start and end of a flowchart.

b) Process – a series of actions taken to a particular end. Square.

c) Decision – action or process of deciding something or resolving a question. Rotated square ‘diamond’

d) Connector – Line or arrow(s) connect one section of the program to another in their logical flow.

e) Input/Output input from the user or output from the program. A slanted square. Rhombus.