PROBLEM SET 3: INTRODUCTION TO COMPUTER PROGRAMMING

LAB ASSIGNMENT – 3A - Table Generation using LOOPING and REPETITION

Overview:

Utilization of Looping structures and process repetition is an efficient way to generate tables of data, especially when the data is related. Many of you may remember learning multiplication using a multiplication table or flash cards. There is an AP for that now, but that is a relatively recent tool.

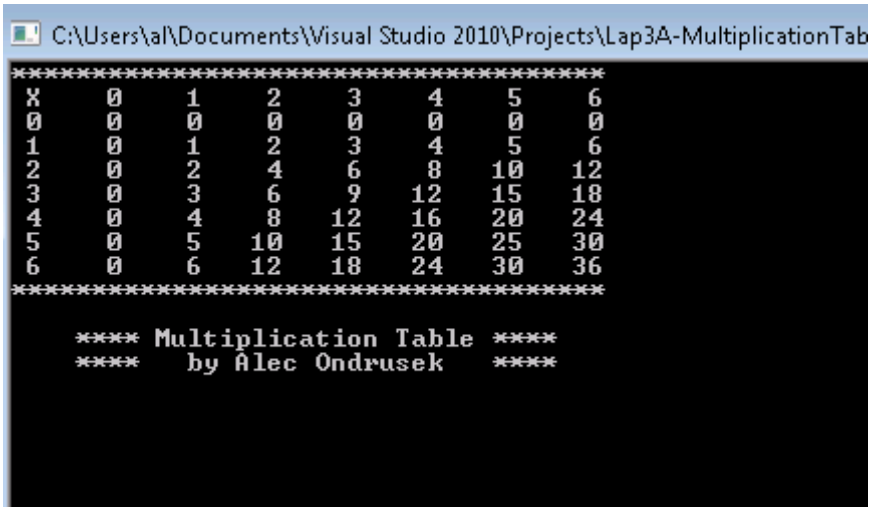
The purpose of this exercise is to challenge your knowledge of repetition statements and apply some basic looping techniques to generate a multiplication table based on the input of the user.

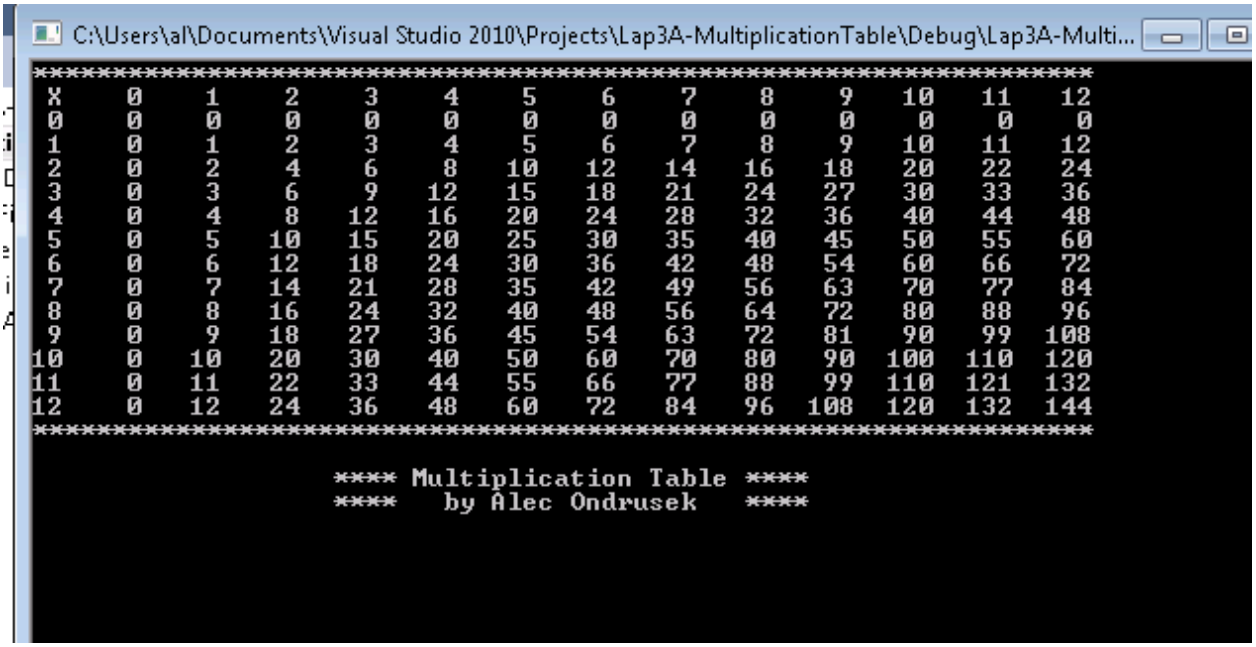
Objective:

Using your textbook, notes and personal research material, write a program using the C Programming language that will display a multiplication table based on the input of the user and the specification provided. **NOTE:** Your source code/program should be well documented as outlined in Handout #2. It **MUST** contain a LOOPING/REPETITION in addition to a looping mechanism for input error checking.

Specifications:

1. User Input:
    a. Size of the table based on how many **digits** or size of the table, not to exceed a multiplication factor of 12.
    b. Provide a looping structure such that if an invalid input is entered, an error message is generated and reports the user for a valid input, and prompts for correct input.
    c. Following the input, the display screen should clear before rendering the output.
2. Output:
    a. An easy to read, aligned table of the size specified by the user input. (See examples) Note the alignment of the numbers.
    b. The table must have a top and bottom line of stars that complement the size of the table.
    c. The also needs to be a title on the display that will adjust as to appear in the centered below the bottom line of stars. (See examples)


C:\Users\al\Documents\Visual Studio 2010\Projects\Lap3A-MultiplicationTab
X 0 1 2 3 4 5 6
0 0 0 0 0 0 0 0
1 0 1 2 3 4 5 6
2 0 2 4 6 8 10 12
3 0 3 6 9 12 15 18
4 0 4 8 12 16 20 24
5 0 5 10 15 20 25 30
6 0 6 12 18 24 30 36
**** Multiplication Table ****
**** by Alec Ondrusek ****


C:\Users\al\Documents\Visual Studio 2010\Projects\Lap3A-MultiplicationTable\Debug\Lap3A-Multi...
X 0 1 2 3 4 5 6 7 8 9 10 11 12
0 0 0 0 0 0 0 0 0 0 0 0 0 0
1 0 1 2 3 4 5 6 7 8 9 10 11 12
2 0 2 4 6 8 10 12 14 16 18 20 22 24
3 0 3 6 9 12 15 18 21 24 27 30 33 36
4 0 4 8 12 16 20 24 28 32 36 40 44 48
5 0 5 10 15 20 25 30 35 40 45 50 55 60
6 0 6 12 18 24 30 36 42 48 54 60 66 72
7 0 7 14 21 28 35 42 49 56 63 70 77 84
8 0 8 16 24 32 40 48 56 64 72 80 88 96
9 0 9 18 27 36 45 54 63 72 81 90 99 108
10 0 10 20 30 40 50 60 70 80 90 100 110 120
11 0 11 22 33 44 55 66 77 88 99 110 121 132
12 0 12 24 36 48 60 72 84 96 108 120 132 144
**** Multiplication Table ****
**** by Alec Ondrusek ****

Instructions

1. Develop and test the program such that it:

    a. Generates the desired output screen with the top and bottom stars and title, with your name.

REPORTING: Submit your executable file, documented source code and screen shots (at least 3 showing various sizes) of your output and submit in a ZIP file for proper consideration.