SOLUTION TO EXERCISE 7
POINTER CODING PROBLEM

The following source code provides one solution for the programming Exercise 7.

/* *********************************************
* Program: e7.cpp - Exercise 7 - Coding Solution *
* Written by: Randy Gibson - Date: 1/1/2012 *
* ***********************************************/

/* ----- PREPROCESSING DIRECTIVES -------------------------- */
#include <iostream> /* load pre-defined code for console I/O */
using namespace std;
define MINDIM 2
define MAXDIM 20

/* ----- FUNCTION PROTOTYPES -------------------------- */

void Intro (int MIN, int MAX);
char AskSymbol ();
void AskSizes (int MIN, int MAX, int &W, int &D);
void TopBot (char S, int W);
void Slice (char S, int W);

/* ============== MAINLINE CONTROL ========================= */

int main ()
{
    int C, /* Counter of # of times to repeat the Slice function */
        WIDE, /* Width of rectangle */
        DEEP; /* Depth of rectangle */

    char SYMB; /* Symbol to draw the rectangle */

    Intro(MINDIM, MAXDIM);
    SYMB = AskSymbol();
    AskSizes (MINDIM, MAXDIM, WIDE, DEEP);
    cout << "\n";
    TopBot (SYMB, WIDE);
    for (C=1; C<=DEEP-2; C++) Slice (SYMB, WIDE);
    TopBot (SYMB, WIDE);

    return 0; /* Send a null error code to the parent process */
}
void Intro (int MIN, int MAX)
{
    cout << "BOX DISPLAYING PROGRAM\n\n";
    cout << "This program will display a rectangle made from a symbol\n";
    cout << "specified by the user and of a width and depth specified\n";
    cout << "by the user. The program will accept user input of width\n";
    cout << "and depth values between " << MIN << " and " << MAX << " (inclusive) only.\n\n";
}

char AskSymbol ()
{
    char S;
    cout << "Symbol to display? ";
    cin >> S;
    return S;
}

void AskSizes (int MIN, int MAX, int &W, int &D)
{
    do
    {
        cout << "Width (" << MIN << "-" << MAX << ")? ";
        cin >> W;
        if (W<MIN || W>MAX)
        {
            cout << "INVALID ENTRY: Enter a value between ";
            cout << MIN << " and " << MAX << " inclusive \n";
        }
    }
    while (W<MIN || W>MAX);

    cout << "Depth (" << MIN << "-" << MAX << ")? ";
    cin >> D; /* Prime read */
    while (D<MIN || D>MAX)
    {
        cout << "INVALID ENTRY: Enter a value between";
        cout << MIN << " and " << MAX << " inclusive -\n";
        cout << "Depth (" << MIN << "-" << MAX << ")? ";
        cin >> D; /* Next read */
    }
} // As reference variables, W and D return automatically
void TopBot (char S, int W)
{
    int I;
    for (I=1; I<=W; I++) cout << S;
    cout << endl;
}

void Slice (char S, int W)
{
    int I;
    cout << S;
    for (I=1; I<=W-2; I++) cout << " ";
    cout << S<<endl;
}