SOLUTION TO EXERCISE 9
POINTER CODING PROBLEM

The following source code provides one solution for the programming Exercise 9.

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* Program: e9.cpp - Exercise 9 - Coding Solution           *
* Written by: Randy Gibson - Date: 1/1/2012                *
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/*/ ----- 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 *WPTR, int *DPTR);
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 *WPTR, int *DPTR)
{
    int D, W; /* Depth and Width of Rectangle */

do
{
    cout << "Width (" << MIN << "-" << MAX << ")? ";
    cin >> W;
    if (W<MIN || W>MAX)
        {cout << "\aINVALID 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 << "\aINVALID ENTRY: Enter a value between";
        cout << MIN << " and " << MAX << " inclusive -\n";
        cout << "Depth (" << MIN << "-" << MAX << ")? ";
        cin >> D; /* Next read */
    }
*WPTR = W; /* Return width using indirection with a pointer */
*DPTR = D; /* Return depth using indirection with a pointer */
}

/* ----- DISPLAY TOP AND BOTTOM OF RECTANGLE ---------------*/

void TopBot (char S, int W)
{
  int I;
  for (I=1; I<=W; I++) cout << S;
  cout << endl;
}

/* ----- DISPLAY A SLICE OF THE RECTANGLE ---------------*/

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