**Practical 12 – Revision Exercises**

1. Trace the following program fragments to determine the output:

|  |
| --- |
| 1. for (int i = 1; i <= 10; i++)   {  for (int j = 1; j < i; j++)  cout << " ";  cout << "\*" << endl;  } |
| 1. for (int i = 1; i <= 10; i++)   {  for (int j = 10; j >= i; j--)  cout << "\*";  cout << endl;  } |
| 1. for (int i = 1; i <= 9; i++)   {  for (int j = 9; j > i; j--)  cout << " ";  for (int k = 1; k <= i; k++)  cout << "\*";  for (int m = i - 1; m >= 1; m--)  cout << "\*";  cout << endl;  } |

A)

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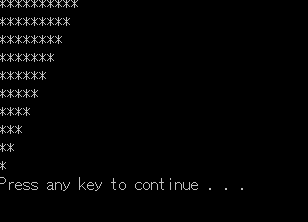
\*

\*

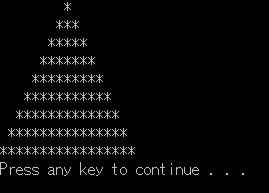
\*

Press any key to continue . . .

B)



c)



1. Trace the following program to determine the output:

|  |  |
| --- | --- |
| #include <iostream>  #include <iomanip>  using namespace std;  void change1 (int& x, int& y);  void change2 (int a, int b, int& x, int& y);  int main(void)  {  int a = 4, b = 6, c, d;  cout << "a = " << setw(2) << a  << ", b = " << setw(2) << b << endl;  change1(a, b);  cout << "a = " << setw(2) << a  << ", b = " << setw(2) << b << endl;  change2(a, b , c ,d);  cout << "a = " << setw(2) << a  << ", b = " << setw(2) << b  << ", c = " << setw(2) << c  << ", d = " << setw(2) << d << endl;  return 0;  } | void change1 (int& x, int& y)  {  x = x + y;  y = y + x;  }  void change2 (int a, int b, int& x,int& y)  {  x = a + b;  y = a \* b;  } |

a = 4, b = 6

a = 10, b = 16

a = 10, b = 16, c = 26, d = 160

Press any key to continue . . .

1. Trace the following program fragments to determine the output:

|  |
| --- |
| 1. char x [20] = "gorilla";   char y [20] = "giraffe";  strcpy (x, y);  cout << x << " " << y; |
| 1. char x [20] = "gorilla";   char y [20] = "giraffe";  strcat (x, y);  cout << x << " " << y; |

a)

girrafe girrafePress any key to continue…

b)

gorrilagirrafe girrafePress any key to continue…

1. Trace the following program to determine the output:

|  |
| --- |
| #include <iostream>  #include <iomanip>  using namespace std;  typedef struct  {  int id;  double payRate;  int hour;  } EMPLOYEE;  int main()  {  EMPLOYEE emp = {1234, 2.50, 5};  double netPay;  netPay = emp.payRate \* emp.hour;  cout << "The net pay of employee " << emp.id << " is "  << fixed << setprecision(2) << netPay << endl;  return 0;  } |

The net pay of employee 1234 is 12.50

1. Write a program that requests lower and upper integer limits, calculates the sum of all the integer squares from the square of the lower limit to the square of the upper limit, and displays the answer. The program should ensure that the lower limit is less than the upper limit. A sample run is as follows:

Enter lower and upper integer limits: 2 8

The sum of the squares from 4 to 64 is 203

Do you want to continue (y or n)? y

Enter lower and upper integer limits: 35 30

Error! The lower limit must be less than the upper limit.

Enter lower and upper integer limits: 5 30

The sum of the squares from 25 to 900 is 9425

Do you want to continue (y or n)? n

1. Write programs that create the following patterns:

(a) 6 5 4 3 2 1

6 5 4 3 2

6 5 4 3

6 5 4

6 5

6

(b) 6 5 4 3 2 1

5 4 3 2 1

4 3 2 1

3 2 1

2 1

1

1. 1

12

123

1234

12345

123456

1234567

12345678

123456789

(d) F

FE

FED

FEDC

FEDCB

FEDCBA

1. Write a function named *triangle* that creates a pattern based on a given number of rows. For example, function call *triangle (4)* will produce the following pattern:

\*

\*\*\*

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1. Write a program to calculate and display the perimeter and area of a right triangle when given the length of two sides (a and b). Your program must include a function that calculates both the perimeter and area and returns them using pass by address. The formula required are:

a

c



b

1. Write a function that takes three arguments: a character and two integers. The first integer specifies the number of times that the character is to be printed on a line, whereas the second integer specifies the number of lines that are to be printed.
2. Write a program that creates two 6-element arrays of integers. The program asks the user to enter values for the first array using a loop. The program sets the elements of the second array to the cumulative totals of the elements of the first array. For example, the 2nd element of the second array is the sum of the first 2 elements of the first array. The 3rd element of the second array is the sum of the first 3 elements of the first array and so on. Finally, the program displays the contents of the two arrays in two columns with the contents of the first array in the first column and the contents of the second array in the second column.
3. Write a program to print out the elements of a two-dimensional array and its totals as shown below:

Total

23 45 29 34 xxx

19 87 4 23 xxx

5 23 16 22 xxx

56 12 34 28 xxx

Total xxx xxx xxx xxx xxx

1. Write a program that will count the number of times each letter of the alphabet (i.e. ‘a’ to ‘z’) appear in a sentence input by user. [Hint: use an array of size 26 to store the frequency for each letter. The index for letter ‘a’ count is 0, for letter ‘b’ count is 1, and so on.]
2. A point on the two-dimensional plane can be represented by two floating-point numbers, x and y.

If p1 = (x1, y1) and p2 = (x2, y2), Midpoint of p1 and p2 = 

Define a structure for a point on the two-dimensional plane and write a program to compute and display the midpoint given the coordinates of 2 points. A sample run of the program is follows:

Enter coordinates for p1: 2.0 5.0

Enter coordinates for p2: 5.0 9.0

The midpoint of p1 and p2: (3.5, 7.0)

1. Declare a structure named TIME that holds two members, hours and minutes. Write a program to obtain a time from the user, store it into the structure, then calculate and display the time one minute later.
2. Define a structure type to represent a fraction. Write a program that gets a fraction and displays the fraction reduced to lowest terms. For example, the fraction 39/52 can be reduced to 3/4.
3. Create a file named Input.txt with the contents below:

90 9 9

88 8 8

81 8 8

79 7 7

70 7 7

Write a program that reads the contents of the Input.txt line by line, multiples the three numbers from one line and write the numbers and the result into Multiply.txt. The program displays the same output to the screen as well.

Sample output in Multiply.txt:

First Second Third Result

90 9 9 7290

88 8 8 5632

81 8 8 5184

79 7 7 3871

70 7 7 3430

1. Create afile named car.txt where each line of data represents a car number, the number of miles driven, and number of gallons of gas used by the car. The contents of the file is:

MBB1254 250 19

MBC6212 525 38

WEF1271 123 6

WBB3485 1322 86

MAA3497 235 14

Write a program that reads the data and displays the car number and the average consumption i.e. the miles per gallon for each car.