Problem Set 2

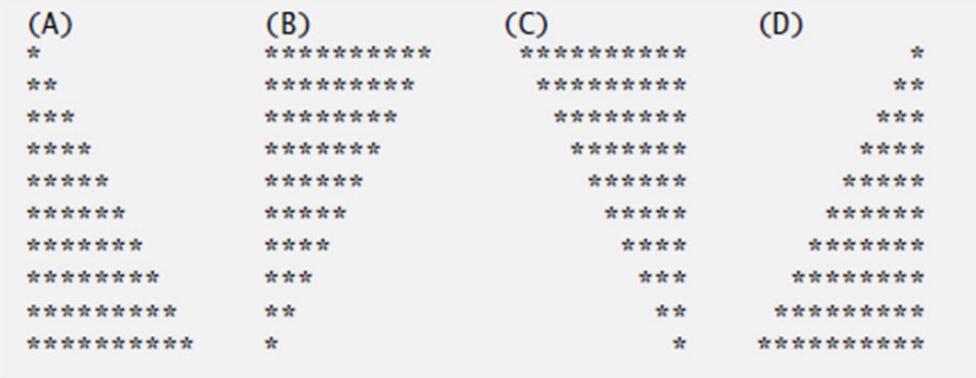
Branching, Iteration, Loops, Strings and Bisection approximation

- Write a program that takes two integers from user and determines and prints whether the first is a multiple of the second.
- Write a program that inputs three different integers from the keyboard, and then prints the sum, the average, the product, the smallest and the largest of these numbers.
- Write a program that reads an integer and determines and prints whether it's odd or even.
- A palindrome is a number or a text phrase that reads the same backward as forward. For example, each of the following five-digit integers is a palindrome: 12321, 55555, 45554 and 11611. Write a program that reads in a five-digit integer and determines whether or not it's a palindrome.
- Write a program that reads three nonzero integer values and determines and prints whether they could represent the sides of a triangle.
- Implement a program which determines the roots of a quadratic equation (take coefficients from user). The program also determines if the roots of the equation are real or imaginary. Display the roots if they are real. Print a message on the output screen about the nature of the roots (*roots are real* or *roots are imaginary*).
- Implement a program that prompts the user to enter 10 integers (there can be repetition). The program will count the number of times the user enters the integer '2'. The count will be displayed on the output screen. Implement using both *while* and *for* loops.
- Implement a program that prints multiples of 5 in the range defined by user such that only 5 numbers are printed on one row. Implement using both *while* and *for* loops.
- Take a number from the user and print its factorial. Implement using both *while* and *for* loops.
- Implement a code that estimates the value of mathematical constant 'e' according to the following formula:

$$e = 1 + \frac{1}{1!} + \frac{1}{2!} + \frac{1}{3!} + \frac{1}{4!} + \ldots$$

  Adding more terms to calculate 'e' will make the value of 'e' more accurate. Prompt the user to enter the number of terms for the desired accuracy of the value of 'e'.
- Ask the user to provide final exam marks of 10 students in *Introduction to Computing* course in order to calculate the average. Use *while* loop for this purpose, and use *break* statement to exit the loop when an invalid input (e.g negative number) is given. Moreover, if marks greater than 100 are given, use *continue* statement to skip that number from average calculation.

- Write programs that print following patterns separately



- Store your first and last name in two variables. Use concatenation operator to concatenate your names and then print it. Also print the length of concatenated string using *len()* function. Use *for* loop to separately print each character of the concatenated string on output.

- Find the square root of 50 using *Guess and Check* and *Bisection* algorithms.