

Practice 7: Extra Exercises

(if you need more programming practice)

1. **Write a program that solves quadratic equations of the form $ax^2 + bx + c = 0$.** It prompts the user for a , b and c . If the equation does not have a real root, it should say so, otherwise print out the roots. Recall the formula

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

2. **Write a program that calculates an estimate for π using the dartboard method.** The program 1000 times generates a random point with x - and y -coordinate in the range 0 to 1. It calculates what proportion lies within distance 1 of the origin. That proportion should be $\pi/4$.

(Note that if you `#include<stdlib.h>`, then the function `rand()` produces a random integer. To get a random real between 0 and 1, you can mod the `rand()` value by a million and then divide it by a million.)

3. **Write a program that calculates the sum of the first so many cubes.** The program prompts the user for N . It then calculates $1^3 + 2^3 + \dots + N^3$ and prints this out.
4. **Write a program that allows the user to guess a number.** The program chooses a random number between 0 and 100. It then repeatedly gets the user to guess a number, replying with “Higher”, “Lower” or “Well Done” until the user guesses the number.
5. **Write a program to print out a crude T.** The user specifies the total number of rows & columns to use, and the program prints out stars to form a T where the horizontal part uses up 1/4 of the rows, and the vertical part uses up 1/3 of the columns. Here is one where the user specified 8 rows and 6 columns.

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