Practical Lab 2

Due date: 23 March 2024 | Software Design 1 (SDN150S)

Question 1: Number to Binary Converter

Description: Write a program that converts a decimal number to binary using a loop.

Programming Steps:

1. Prompt the user to enter a decimal number.
2. Use a loop to convert the number to binary and store the binary digits.
3. Display the binary representation.

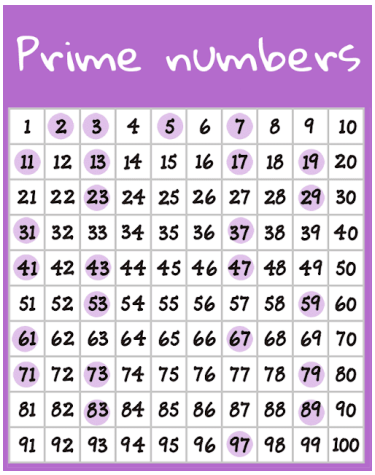
Decimal	Binary	Hexadecimal
0	0000	0
1	0001	1
2	0010	2
3	0011	3
4	0100	4
5	0101	5
6	0110	6
7	0111	7
8	1000	8
9	1001	9
10	1010	A
11	1011	B
12	1100	C
13	1101	D
14	1110	E
15	1111	F

Question 2: Prime Number Checker

Description: Implement a program that checks if an input number is prime.

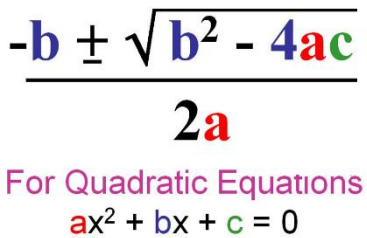
Programming Steps:

1. Prompt the user to input a number.
2. Use a *for loop* to check if the number is divisible by any number other than 1 and itself.
3. Use a *nested if statement* to give feedback on whether the number is 1, prime, or not prime.



Question 3: Quadratic Equation Solver

Description: Develop a program that solves quadratic equations $(ax^2 + bx + c = 0)$ using the quadratic formula. Handle different types of roots (real and different, real and equal, complex and different).



Programming Steps:

1. Ask the user to enter coefficients a, b, and c.
2. Calculate the discriminant $(D = b^2 - 4ac)$.

3. Use any conditional statements to calculate and display the roots based on the discriminant's value.
4. Ask the user to choose action (either re-enter coefficient values a, b, and c or exit program).

Condition:

- If the discriminant is greater than 0, show that roots are both real and different. Where ***Root1*** = $(-b + \sqrt{D}/2a)$ and ***Root2*** = $(-b - \sqrt{D}/2a)$.
- If the discriminant is equal 0, show that roots are both real and the same, where ***Root1*** = ***Root2*** = $(-b/2a)$.
- If the discriminant is less than 0, show that roots are both complex and different, where ***Root1*** = $(-b/2a)$ and ***Root2*** = $(-b - \sqrt{D}/2a)$.