KJ's Educational Institutes
K J College Of Engineering & Management Research, Pune.
Department of E & TC

CLASS: S. E. (E &TC) **SUBJECT:-DSA**

Ex. No: 10 **Date:**

AIM
Write a program to convert a Decimal number to a binary number using a stack.

OBJECTIVES

- To implement a program in C that converts a decimal number into a binary number using the **stack data structure**.

THEORY

1. **Decimal to Binary Conversion**

- Decimal numbers (base 10) can be converted to binary numbers (base 2) by repeatedly dividing the number by 2 and storing the remainders.
- Example:
  Decimal `10` → Binary `1010`
  - 10 ÷ 2 → Quotient = 5, Remainder = 0
  - 5 ÷ 2 → Quotient = 2, Remainder = 1
  - 2 ÷ 2 → Quotient = 1, Remainder = 0
  - 1 ÷ 2 → Quotient = 0, Remainder = 1
  - Binary = **1010** (read remainders in reverse order).

2 **Role of Stack**

- Since remainders are generated in reverse order, a **stack (LIFO)** is the best data structure to store remainders.
- Push each remainder onto the stack.
- Pop all elements from the stack to get the binary number in correct order.

3. Applications

- Number system conversions.
- Used in digital circuits and low-level programming.

ALGORITHM

1. Read the decimal number n.
2. While n > 0:
    - Compute remainder = n % 2.
    - Push remainder onto stack.
    - Update n = n / 2.
3. Pop and print all elements from the stack → Binary number.

INPUT:

- Enter the decimal number

OUTPUT:

Enter a decimal number: 25
Binary equivalent of 25 is: 11001

CONCLUSION:-