Computer Networks Lab

Experiment-3:

Write a Program to implement data link layer farming method checksum.

Description:

A **checksum** is a simple error-detection method used in the data link and transport layers of networks. It helps ensure data integrity during transmission by:

- **Summing up data values**

- **Sending that sum (or a complement of it)** along with the data

- The **receiver recomputes the checksum** and compares it to the received one to check for errors

- The % 256 keeps the checksum in the range of a single byte (0–255).
- This is a simplified version suitable for learning and demonstrating basic concepts.

Code:

```
#include <stdio.h>

#include <string.h>

// Function prototype

void receiver(char data[], int received_checksum);

// Function to calculate checksum

int calculate_checksum(char data[]) {

    int sum = 0;

    for (int i = 0; data[i] != '\0'; i++) {

        sum += data[i];
```

```c
    }

    return sum % 256;

}

// Sender function

void sender(char data[]) {

    int checksum = calculate_checksum(data);

    printf("\nSender:\n");

    printf("Data: %s\n", data);

    printf("Checksum: %d\n", checksum);

    // Call receiver

    receiver(data, checksum);

}

// Receiver function

void receiver(char data[], int received_checksum) {

    int calc_checksum = calculate_checksum(data);

    printf("\nReceiver:\n");

    printf("Received Data: %s\n", data);

    printf("Received Checksum: %d\n", received_checksum);

    if (calc_checksum == received_checksum) {

        printf("Data is valid. No error.\n");

    } else {

        printf("Checksum mismatch! Data corrupted.\n");

    }
```

```c
}

int main() {

    char data[100];

    printf("Enter data to send: ");

    fgets(data, sizeof(data), stdin);

    // Remove newline

    data[strcspn(data, "\n")] = 0;

    sender(data);

    return 0;

}
```

Output:

Enter data to send: hello

Sender:

Data: hello

Checksum: 20

Receiver:

Received Data: hello

Received Checksum: 20

Data is valid. No error.

Example: "hello"

Let's break it down:

Character ASCII Value

Character	ASCII Value
h	104
e	101
l	108
l	108
o	111

Sum = 104 + 101 + 108 + 108 + 111 = 532

Checksum = 532 % 256 = 20