**Lab Practical #14:**

Implementation of parity bit check Using C/Java language with example.

**Practical Assignment #14:**

1. **C/Java Program: Implementation of parity bit check Using C/Java language.**

#include <stdio.h>

int calculateParity(int data[], int size, int isEvenParity)

{

int count = 0;

for (int i = 0; i < size; i++)

{

if (data[i] == 1)

{

count++;

}

}

if (isEvenParity)

{

return (count % 2 == 0) ? 0 : 1;

}

else

{

return (count % 2 == 0) ? 1 : 0;

}

}

int verifyParity(int data[], int size, int receivedParityBit, int isEvenParity)

{

int oneCount = 0;

for (int i = 0; i < size; i++)

{

if (data[i] == 1)

{

oneCount++;

}

}

if (receivedParityBit == 1)

{

oneCount++;

}

if (isEvenParity)

{

return (oneCount % 2 == 0);

}

else

{

return (oneCount % 2 != 0);

}

}

int main()

{

int data[] = {1, 0, 1, 1, 0, 1};

int size = sizeof(data) / sizeof(data[0]);

int isEvenParity;

printf("Choose the parity type:\n");

printf(" Enter 1 for Even Parity\n");

printf(" Enter 0 for Odd Parity\n");

printf("Your choice: ");

scanf("%d", &isEvenParity);

if (isEvenParity != 0 && isEvenParity != 1)

{

printf("Invalid choice. Please run again and enter 0 or 1.\n");

return 1;

}

printf("\nOriginal Data: ");

for (int i = 0; i < size; i++)

{

printf("%d", data[i]);

}

printf("\n");

printf("Parity Type Selected: %s\n", isEvenParity ? "Even" : "Odd");

int parityBit = calculateParity(data, size, isEvenParity);

printf("Sender: Calculated Parity Bit is %d\n", parityBit);

printf("Sender: Full message to send is ");

for (int i = 0; i < size; i++)

{

printf("%d", data[i]);

}

printf("%d\n", parityBit);

printf("\n--- Simulating Data Reception ---\n");

int receivedData[size];

printf("Enter the %d bits of the data you 'received':\n", size);

for (int i = 0; i < size; i++)

{

printf("Enter bit %d: ", i + 1);

scanf("%d", &receivedData[i]);

}

int receivedParityBit = parityBit;

printf("\nReceiver: Checking received message ");

for (int i = 0; i < size; i++)

{

printf("%d", receivedData[i]);

}

printf("%d\n", receivedParityBit);

if (verifyParity(receivedData, size, receivedParityBit, isEvenParity))

{

printf("Result: Parity check PASSED.(Data is considered correct)\n");

}

else

{

printf("Result: Parity check FAILED. (Error detected)\n");

}

return 0;

}