**Cycle - 2**

**(Experiment - 1)**

**Question:**

Write a program for error detecting code using CRC-CCITT (16-bits).

**Program:**

#include <stdio.h>

#include <string.h>

char data[100], crc[16], gen[17];

int len, i, j;

void calc\_crc() {

for (i = 0; i < strlen(gen); i++)

crc[i] = data[i];

do {

if (crc[0] == '1') {

for (j = 1; j < strlen(gen); j++)

crc[j] = ((crc[j] == gen[j]) ? '0' : '1');

}

for (j = 0; j < strlen(gen) - 1; j++)

crc[j] = crc[j + 1];

crc[j] = data[i++];

} while (i <= len + strlen(gen) - 1);

}

int main() {

printf("Enter Bit string: ");

scanf("%s", data);

len = strlen(data);

printf("Enter generating polynomial (16 bits): ");

scanf("%s", gen);

if (strlen(gen) != 16) {

printf("Generator polynomial must be 16 bits.\n");

return 1;

}

printf("Generating Polynomial: %s\n", gen);

for (i = len; i < len + strlen(gen) - 1; i++)

data[i] = '0';

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

calc\_crc();

printf("Checksum is: %s\n", crc);

for (i = len; i < len + strlen(gen) - 1; i++)

data[i] = crc[i - len];

printf("Final Codeword is: %s\n", data);

printf("Test Error detection\n1(Yes) / 0(No)? : ");

scanf("%d", &i);

if (i == 1) {

printf("Enter position to insert an error: ");

scanf("%d", &i);

data[i] = (data[i] == '0') ? '1' : '0';

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

}

calc\_crc();

for (i = 0; (i < strlen(gen) - 1) && (crc[i] != '1'); i++);

if (i < strlen(gen) - 1)

printf("Error detected.\n");

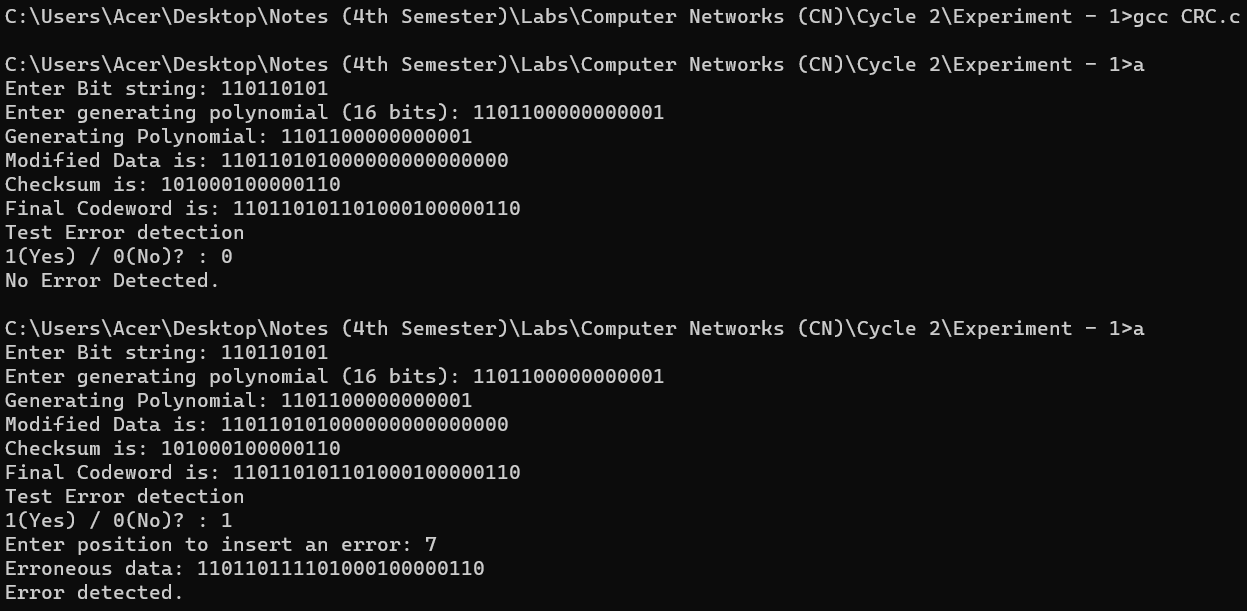
else

printf("No Error Detected.\n");

return 0;

}

**Output:**

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