Lab-9

9.1)C program for CRC-CCITT

```
#include <stdio.h>
#include <stdint.h>
#define CRC_POLY 0x11021
#define INITIAL_CRC 0xFFFF
uint16_t compute_crc(uint8_t *data, size_t length) {
  uint16_t crc = INITIAL_CRC;
  for (size_t i = 0; i < length; i++) {
    crc ^= (data[i] << 8);
    for (int j = 0; j < 8; j++) {
       if (crc & 0x8000) {
         crc = (crc << 1) ^ CRC_POLY;
       } else {
         crc <<= 1;
  }
  return crc & 0xFFFF;
int check_crc(uint8_t *data, size_t length, uint16_t expected_crc) {
  uint16_t computed_crc = compute_crc(data, length);
  return (computed_crc == expected_crc);
int main() {
  uint8_t data[] = "Hello, World!";
  size_t data_length = sizeof(data) - 1;
  printf("Data: %s\n", data);
  uint16_t crc = compute_crc(data, data_length);
  printf("Computed CRC-CCITT: 0x%04X\n", crc);
  uint8_t received_data[] = "Hello, World!";
  size_t received_length = sizeof(received_data) - 1;
  if (check crc(received data, received length, crc)) {
    printf("Data received correctly with no errors.\n");
    printf("Error detected in received data!\n");
  return 0;
output:=
 Data: Hello, World!
 Computed CRC-CCITT: 0x67DA
 Data received correctly with no errors.
```

```
OBSERVATION:=
     Dunte a program for error directing code using
         #include Litario, h)
         It include ( stdil- h)
        # define CRC_POLY 0x11021
        # define Initial-crc Oxfffff
        unt 10-+ compute - cra (unit & t *dato, size-t length) &
             unit 16-t crc = initial-crc)
                    for (size-ti=o; iclength, itt) &
                         crc ~ (data (i) LC P);
                    ter (int j=0 1) cost+1) {
                       if Carc & OXBOU) E
                            (re = core eci) A cre-poly
                         yelse [
                           crc LC=1; 7 yy
                       return cre & ox HFF 3
          int Check - crc Conits-+ + dato, size-+ length, unitic-1 excepted-oral
                   unit 16-t computed - cre = compute - cre (dato, length);
                  return (computed - crc = = excepted - crc);
        int mainers
            unitat datal)
            size-t data-length = (neot (data)-)
                 perint (" Date T.s \n", date ),
               unt 10-terc = computer_crc (date, date length);
                pount (cre)
              unit -+ recived -data () = "Heleo, Loid:"?
              SIZP-+ recived - length = size of (recived_Date)-1
```

if (checked-cre (recived-dato, recived-length, (re)) {

3 eles puint (4 RD ir \n'1);

returno

Dato: Hello, World!

Computed CRC-CCITT: OXGFDA

Data Recived correctly with no errors

Data Recived correctly with no errors

9.2) C PROGRAM FOR LEAKY BUCKET

```
// Online C compiler to run C program online
#include<stdio.h>
int main(){
  int incoming, outgoing, buck_size, n, store = 0;
  printf("Enter bucket size, outgoing rate and no of inputs: ");
  scanf("%d %d %d", &buck_size, &outgoing, &n);
  while (n != 0) \{
     printf("Enter the incoming packet size : ");
     scanf("%d", &incoming);
     printf("Incoming packet size %d\n", incoming);
     if (incoming <= (buck_size - store)){</pre>
       store += incoming;
       printf("Bucket buffer size %d out of %d\n", store, buck_size);
     } else {
       printf("Dropped %d no of packets\n", incoming - (buck_size - store));
       printf("Bucket buffer size %d out of %d\n", store, buck_size);
       store = buck_size;
     }
     store = store - outgoing;
     printf("After outgoing %d bytes left out of %d in buffer\n", store, buck_size);
     n--;
  }
```

```
output:=
```

```
Enter bucket size, outgoing rate and no of inputs: 4
3
Enter the incoming packet size : 5
Incoming packet size 5
Dropped 1 no of packets
Bucket buffer size 0 out of 4
After outgoing 1 bytes left out of 4 in buffer
Enter the incoming packet size : 5
Incoming packet size 5
Dropped 2 no of packets
Bucket buffer size 1 out of 4
After outgoing 1 bytes left out of 4 in buffer
Enter the incoming packet size : 7
Incoming packet size 7
Dropped 4 no of packets
Bucket buffer size 1 out of 4
After outgoing 1 bytes left out of 4 in buffer
=== Code Execution Successful ===
```

```
sprogran leadey Bushet program >
                                                          17-12-2024
   # include estation h)
        int mainer &
        int incowing courgoing, buck - cize, n. store=0;
            pount ("no of Inp");
             scarf ["Id : I.d I.d", & buck - 5120, & outgoing, &n);
         - hen (n1 = 0) {
             pounté (« Enler packet-size.")
               Scanf (" r.d", & incording))
               poulnt (" incoming packed size " d \n", incoming);
              if (Luning c = buck - size - store) {
                   pouint (" Bucket Buffet size r. d out of r.d \n", stor
                        buch - 512 e) 3
                       print l'oropped r. d no of padets \n", incoming-
                       printf ( Bucket Buffer size Y. down 1. d \n', ctor
                                 buck -size)
                         store = Buck - size; }
                  store - store-outgoing
                   posints ("After Butgoing 1. d tbytes left out of 1.d
                               Buffer ", store, buck -size);
       Owput =
      Enter bucketsize, outgoing rute and no of inputs: 4 33
       Enter the incoming parketsizes
        Drop 1 no of packets
        Buffer size o out of y
        After outgoing 1 bytes lettout of 4 in Buffer
        Enter the incorning packetsize: or
         incoming packed incom
       Dropped anost parkets
         Bucket Buffersize 1 out of y
         After outgoing I bytes left out of uin buffer
```

Inter the incoming packed size 17
incoming packed size 7

Dropped uno of packed 7

Dropped uno of packed 7

Dropped uno of packed 8

Bropped uno of packed 8

Bropped uno of packed 8

Alter outgoing 1 bytes left out uin Buffer

Alter outgoing 1 bytes left out uin Buffer