CYCLE-2

PROGRAM1: Write a program for error detecting code using CRCCCITT (16-bits) OBSERVATION:

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chedilum
def - co
del xor (divedad, divera):
  scaret 2"
    Jun & In sounge (1, 1en Colortos):
        secret += 1011 five dond ( ) == divisor ( ) elie 1/
         oretion oresult.
 def one (data, gen-poly);
     dorbra-length = lencododor)
       gen - longth = lon (gon-poly)
      gooded_dam = data + 10 * * (gen - length -1)
        aloch - value = podded -dahitgen - length]
  det revenu (data yen-pory):
       sumariado = (sc (doda, y en-pory)
         1) in semande:
              powert (" Everie ?)
        else:
             pount ("No every")
    1/2 -name = == "_ main - ";
         date = grant (" Enter detail)
          yen-poly = Anpud (" But en polynomod")
          dred - value = cac (data, gon-pay).
           overelod -data = enpul (" Enter oceaned dada ")
           scecenus (seecond-dato, gen-poly)
```

```
pick += 1
  if tmp[0] == '1':
    tmp = xor(divisor, tmp)
else:
    tmp = xor('0' * pick, tmp)
  checkword = tmp
return checkword
def encode(data, key): key_len = len(key)
appended_data = data + '0' * (key_len - 1)
remainder = mod2div(appended_data, key)
codeword = data + remainder
print(f"Encoded Data: {codeword}")
return codeword
def decode(data, key):
  remainder = mod2div(data, key)
print(f"Remainder after decoding: {remainder}")
if '1' not in remainder:
     print("No error detected in received data")
else:
    print("Error detected in received data")
# Main function
if __name__ == "__main__":
  data = input("Enter the data bits: ")
  key = input("Enter the key (divisor): ")
  # Encoding
  encoded_data = encode(data, key)
  # Decoding
  print("\nDecoding the encoded data...")
decode(encoded_data, key)
```

OUTPUT:

Enter the data bits: 111100000111010

Enter the key (divisor): 1010111 Encoded Data: 11110000011101010101

Decoding the encoded data...

Remainder after decoding: 000000

No error detected in received data

=== Code Everution Successful ===

PROGRAM2: Write a program for congestion control using Leaky bucket algorithm. OBSERVATION:

```
Leokey Bucket
I weste a parequan for congestion control carny leady bushet algin
program: I bucket.cc
#milade <stdpo.h>
# anclude < stall b. h>
# gneludo < ungstd.h>
 # defeno NOT_PACKETS
 1* ant seard (enta) {
     ent an= (random () % (0) 1, 00)
     ocetur sin == 0 ? (! sin;
 #
 # Endude < stallub.h>
      long ent sandom (voed) 3
XIX
 Int marn()
 I'mt pallet_Sz[NOF_PACKETS], 9, elkob_size, o-wate,
    P-52-sum=0, P-52, p-time-op;
    for (8=0., 9 < NOF_PACKETS; Hi)
        partiel_sztij= veandom () 4.100;
     four (1=0'9 i < WOF-PACKETS; ++1)
          poundf("In packet[10]: 7d bytes It", i, packet-sz(1);
      perent of ("In Enter Output rate: "):
      scanf ("Yd", do suste);
      parentf("Enter buched size:");
       scomp ("1d", & b-size) ;
       for (1:0's i < NOT_PAGLETS; ++1)
          If (podict-szti]+ p-szem) > bsije)
              16 ( packet-52[1] > b-81 70)
                  14 compace the packet size in burnet size */
```

pounds ["In In Incomeng paved size (Ld bytes) as
queater than budget capacity (Ld bytes) - PACKET

REJECTED", packet-Sz[1] | b-size);

puent ("In in Budget Capacity exceeded - packets
perecrep!!").

elce s

P-sz-sem += packet - sztij;

burnt f ("In Byter remaining to transmet; Y-d", partet-sztrj

11 pattime = Mandom () * 10;

U perint f(" in teme left for transmerer on: Y-d units",

1 far (clk = 10; clk = p-tomo; clk t = 10) whole (p-sz_sim >0) { sleep(1);

10 f (p-52 - em) \$

ompourny with output rate */

op = \$-52 -sm , p-52-2m=0;

dre

peant f("In packet of size Y.d Transmetted", op) is peant f("In Byter , lemanner to transmet! Y.d"

P-52-910)'o

every present f("In No of partiets to transmet 1!"); 3337

Det put:

pachet [0]: 83 bytes pachet [1]: 86 bytes packet [9]: 77 bytes

packet [3]: 15 bytes

packet [11]: 93 bytes

packet [11]: 93 bytes

enter the output state: 30

enter the burnet eige: 85

Incoming packed sije: 83

Bytel ournaining to transmet: 83

packet of sije 30 foransmetted -- Byter Remaing to transmet: 13

packets of sije 30 foransmetted -- Byter Remaing to transmet: 23

packets of sije 23 foransmetted -- Byter Remaining to transmet: 0

Freemeng packet 2:3e; 47

Byter sumaining to transmet: 47

pucket of sige 30 transmetted - Byter Remaining to Fransmet: 47

packet of sige 30 transmetted - Payter Remaining to Fransmet: 17

CODE:

```
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h> // for sleep function
#define NOF_PACKETS 5
// Function to simulate sending packets void send packet(int
packet_size, int output_rate) { while (packet_size > 0) {
                                                               int
sent = (packet size < output rate) ? packet size : output rate;
                                                     packet_size -=
printf("Packet of size %d Transmitted---", sent);
sent;
          printf("Bytes Remaining to Transmit: %d\n",
                  sleep(1); // Simulate time delay between packets
packet_size);
}
int main() {
  int output_rate, bucket_size, incoming_packet_size;
  int i, packet size[NOF PACKETS];
  // Input number of packets and their sizes
for(i = 0; i < NOF_PACKETS; i++) {
     packet size[i] = rand() % 100; // Random packet size between 0 and 99
printf("packet[%d]:%d bytes\n", i, packet_size[i]);
  }
  printf("Enter the Output rate:");
  scanf("%d", &output rate);
  printf("Enter the Bucket Size:");
  scanf("%d", &bucket_size);
  for(i = 0; i < NOF PACKETS; i++) {
                                             printf("\nIncoming Packet size: %d\n",
packet_size[i]);
                    if(packet_size[i] > bucket_size) {
                                                             printf("Incoming packet
size (%dbytes) is Greater than bucket capacity (%dbytes)-
PACKET REJECTED\n", packet_size[i], bucket_size);
continue:
     }
     printf("Bytes remaining to Transmit: %d\n", packet_size[i]);
send_packet(packet_size[i], output_rate);
return 0;
```

OUTPUT:

```
packet[0]:83 bytes
packet[1]:86 bytes
packet[2]:77 bytes
packet[3]:15 bytes
packet[4]:93 bytes
Enter the Output rate:50
Enter the Bucket Size:300
Incoming Packet size: 83
Bytes remaining to Transmit: 83
Packet of size 50 Transmitted---Bytes Remaining to Transmit: 33
Packet of size 33 Transmitted---Bytes Remaining to Transmit: 0
Incoming Packet size: 86
Bytes remaining to Transmit: -86
Packet of size 50 Transmitted---Bytes Remaining to Transmit: 36
Packet of size 36 Transmitted---Bytes Remaining to Transmit: 0
Incoming Packet size: 77
Bytes remaining to Transmit: 77
Packet of size 50 Transmitted---Bytes Remaining to Transmit: 27
Packet of size 27 Transmitted---Bytes Remaining to Transmit: 0
Incoming Packet size: 15
Bytes remaining to Transmit: 15
Packet of size 15 Transmitted---Bytes Remaining to Transmit: 0
Incoming Packet size: 93
Bytes remaining to Transmit: 93
Packet of size 50 Transmitted---Bytes Remaining to Transmit: 43
Packet of size 43 Transmitted---Bytes Remaining to Transmit: 0
```

PROGRAM3: Using TCP/IP sockets, write a client-server program to make client sending the file name and the server to send back the contents of the requested file if present.

OBSERVATION:

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    to under clant generally the felo manie & the Sounds to say
    book the centent of the acquested felo of pourent
    Client Deseguane
    ations TCP. Py
    from socket Impart &
    Secure Name: "184.0.0.1"
    Seemon Prost = 12000
    (MASST2. WOB. FINT_TA) towas = towas broads
    elsent Socket, connect ((Somes Name. Secure Doct))
     Sentence: enput (" In order Jelo namo: ")
    · claim doublet. send (sendence-renuedo())
     procontents - client societ. sicco (1024), deusde()
     perent ("fele In Forom Securer: In")
     perent (felecontents)
     elient Socket. (loco ( )
     Lecures. Py peroquan
     fecom socket surposed *
     Sumoname : "127.0.0.1"
      Summer Pard = 12000
     Scenes Sochet = Socket (AF_INEY, SOCK_STREAM)
      Secures Socket. blad (15 comes Name. Secures Pord))
      20mer Soutet. 1ston(1)
      while !
           parent (" The genus es seedy to seccenc")
            Connection Saket, eds: Sesuen Sochet, accept ()
            sendence = Connection Socket, siecv (1094), duodet)
            fale : open (sentence . 11 se")
      file = open (sentence . "si.)
```

```
L= felc. seed (1027)

connocteon Societ. Renol (J. enewclet))

connocteon Societ. Renol (J. enewclet))

perent ("In Sent contents of + Sentence)

pale. close ()

connocteon Rocket. close ()

connocteon Rocket. close ()

connocteon Rocket. close ()

controlled Seewer 22 secondy to accepte

sent contents of seewer. py
```

Follow Seamer:

Journ Sochet 9m/med *

SermenName = "127.0.0.1"

sermenPort = 12000

Sermen Sochet = Sochet (AF_INET, Sock, STREAM)

Sermen Sochet. bind (Esermen Name, SermenPort))

client -> Enter fele name: Recuer. py

Sermer Sochet. leten D

Whale 1:

parend ("The Seemen on secoly to receive")

connection socket. ordoer = Seemen cocket. except()

sentence = Connection Socket. orecv (1024). democe ()

fele zopen (Sentence, "a")

l=fele. accol (1024)

Connection socket. send (l. encede())

parent ('In sent contents of + Sentence)

fele. close()

Connection socket. close()

weekend and and detailed the transfel -

CODE:

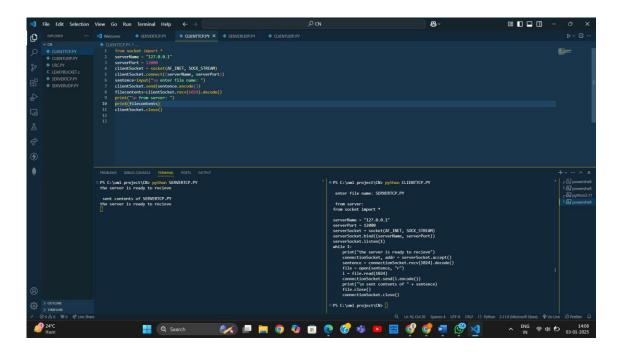
SERVERTCP.PY:

from socket import *

CLIENTTCP.PY:

```
from socket import *
serverName = "127.0.0.1"
serverPort = 12000
clientSocket = socket(AF_INET,
SOCK_STREAM)
clientSocket.connect((serverName, serverPort))
sentence=input("\n enter file name: ")
clientSocket.send(sentence.encode())
filecontents=clientSocket.recv(1024).decode()
print("\n from server: ")
print(filecontents)
clientSocket.close()
```

OUTPUT:



PROGRAM4: Using UDP sockets, write a client-server program to make client sending the file name and the server to send back the contents of the requested file if present. OBSERVATION:

```
OBSERVATION:
  1) Using UDP Sochets, worte a client - comes paym to make
   event sending the file name & seemes to send back
    contents of acquested Julo if bousent.
   Solution:
   Client . Py
   from societ surport +
   Secure Normo : "127.0.0.1"
    seems part = 12000
    Cheversocket = Sochet (AF_INGT, SOCK_DGRAM)
   sentance = Input ("In Enter Julo namo:")
   chent societ. send to (byter (sentence, "vtf-8"), (some name,
   Somer Port)
    Jelo contents - Somes Address = Chent Sahet. sicer ferons (2018)
    pount (" In Repy from Seemer: In)
     porut ( fele Contente. dowd ( "U+ of -8"))
    # for ? In jele contents:
        # perent (st & (1), end = ")
     chentsochet. close()
     dientsodiet. dose ()
    Somer py
   from sochet Emport *
   seemer port = 12000
   Some Sochet = Sochet (AF-INET, COCH - DGRAM)
   Seems Socket. band ((", 27.0.0.1", Seems Pood))
    parent (" The server is deody to decerne")
     while 1:
        sentence, chent Address = Seomer Count. seer ferom Box
        Sentance - Sentence . Loude ("Utf-8")
        Con = 1ele. swood (2 ans)
        Senuer Sochet. Send to (byles (con, "off-8"). client Address)
```

```
pount ( In Sout Conterts of ', and = ' 1)
bount (sendence)
# lou 9 an sendenco;
    # pared (Sto (1), end = 11)
  Jula closo ()
Dut put :
somes -> The server or newdy to accorne.
sent contents of Seemen-py
The securer so divody to decerne
 dient -> dient.py
 Enter fele namo: Seower.py
 Reply form Scower:
 Journ Sochel empart *
 como port = 12000
 Some Sochet = Sochet (AF_INEY, COCH_DGRAM)
  Sevier Socket. band (11/21.0.0.11, Cerue Pood))
  while 1:
      pount (The servou is sundy to successon)
       centenio, chard Address = Reversomet. Herr from (2011)
       gentence = sentence. Lewde ("Utf-g")
        Jule = open (sentenio, 1941)
         1= jule, sund (2048)
        Securer Socket. Soudto ( bytes (4, " Utf-8"), cloud Address )}
        parent ('In sent contents of', end: ')
        persua (sentence)
        # for ? an sentence:
           # perend (sto(1) , and = ' 1)
         Jele. cloce ()
```

```
● CLENTROPPY X

CLENTROPPY X

CLENTROPPY X

I from socket laport *

ServerPort = 12000

ClientSocket = "Socket [AF_IRIT, SOCK_DGMN)

sentence = "spart("s) enter file name: ")

ClientSocket = socket [AF_IRIT, SOCK_DGMN)

filecontents _ serverPoderess = clientSocket.recviron(2005)

pelmt("ellecontents.decode("utf-8"))

pelmt("ellecontents.decode("utf-8"))

PS C:\mail_project\(Clip \text{pythm SERVERUPP.PY} \)

File "C:\mail_project\(Clip \text{pythm SERVERUPP.PY} \)

from server:

from server
```

WIRESHARK: 1) Using UDP Sochets, worte a client -comes paym to melo event sending the file name & senies to send back of sequested Julo if bosesent. Solution: Went . Py from societ suport + secures Normo : "127.0.0.1" seems part = 12000 chertsocket = Sochet (AF_INET, Sock_DGRAM) sentance = 9nput ("In Enter fulo namo:") client societ. send to (byter (sentence, "Utf-8"), (some name, Somer Pout) Jelo contents - Serves Address = Chent Sochet. seen ferons (2018) pount (" In Pepy from Seemer: Ini) porrut (fele Contente. Lowd ("U+f-8")) # fora ? In Jele contents: # pernt (sto (1), end=") chentsochet. close() dientsodiet.dose() Somer py from sochet Emport + somer port = 12000 Some Sochet = Sochet (AF-INET, COCK - DGRAM) Seems Socket. band ((", 27.0.0.1", Seems Pood)) parent (" The server is decopy to decerne") while 1. sentence, chent Address = Seomer Court. seer ferom (300) Sentence - Sentence . Loude ("Utf-8") Con = fele. secod (2018) Semuer Sochet. Send to (bytes (con, off-81). client AddreR)