VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"JnanaSangama", Belgaum -590014, Karnataka.



LAB REPORT on

COMPUTER NETWORKS

Submitted by

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in partial fulfillment for the award of the degree of BACHELOR OF ENGINEERING
in
COMPUTER SCIENCE AND ENGINEERING



B.M.S. COLLEGE OF ENGINEERING
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JUN-2023 to SEP-2023

B. M. S. College of Engineering, Bull Temple Road, Bangalore 560019

(Affiliated To Visvesvaraya Technological University, Belgaum) **Department of Computer Science and Engineering**



CERTIFICATE

This is to certify that the Lab work entitled "LAB COURSE COMPUTER NETWORKS" carried out by AVANI KAMATH(1BM21CS036), who is bonafide student of B. M. S. College of Engineering. It is in partial fulfillment for the award of Bachelor of Engineering in Computer Science and Engineering of the Visvesvaraya Technological University, Belgaum during the year 2023. The Lab report has been approved as it satisfies the academic requirements in respect of a Computer Networks (22CS4PCCON) work prescribed for the said degree.

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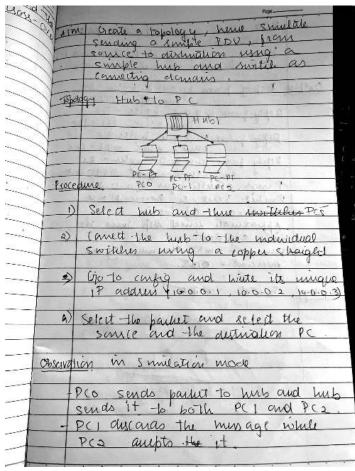
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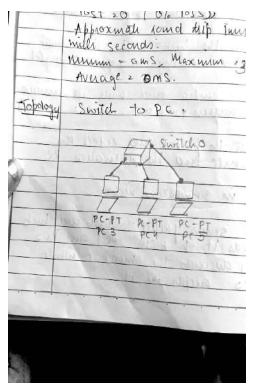
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Experiment No 1

Create a topology and simulate sending a simple PDU from source to destination using hub and switch as connecting devices and demonstrate ping message.



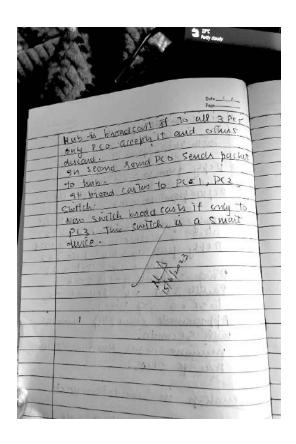
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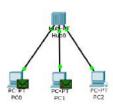
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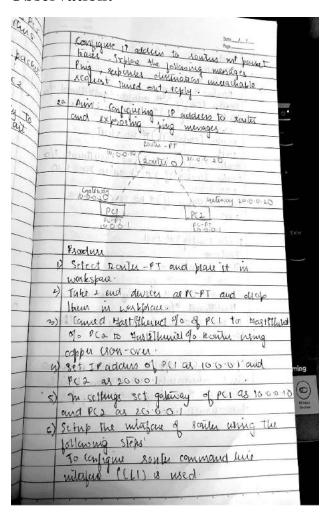
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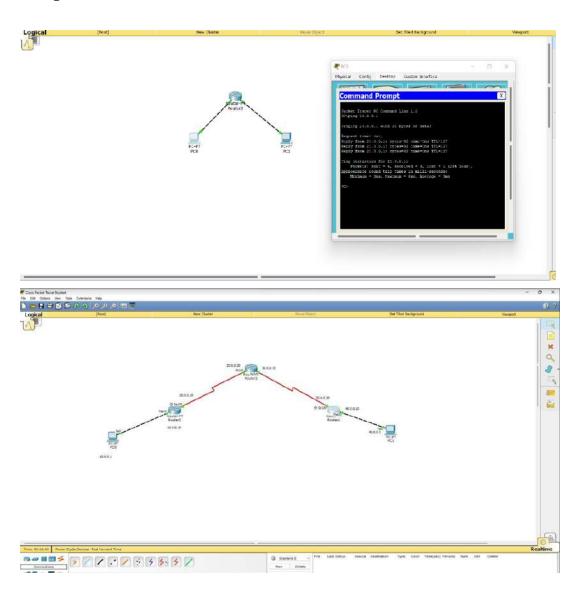
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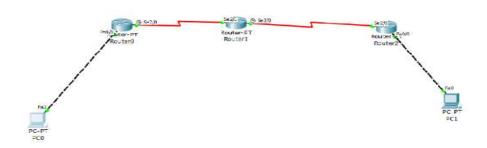
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for each and were sorth many		





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Command Prompt

Packet Tracer PC Command Line 1.0
PC>ping 40.0.0.1

Pinging 40.0.0.1 with 32 bytes of data:

Request timed out.

Reply from 40.0.0.1: bytes=32 time=2ms TTL=125

Reply from 40.0.0.1: bytes=32 time=2ms TTL=125

Reply from 40.0.0.1: bytes=32 time=2ms TTL=125

Ping statistics for 40.0.0.1:

Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),

Approximate round trip times in milli-seconds:

Minimum = 2ms, Maximum = 16ms, Average = 6ms

PC>ping 40.0.0.1

Pinging 40.0.0.1 with 32 bytes of data:

Reply from 40.0.0.1: bytes=32 time=2lms TTL=125

Reply from 40.0.0.1: bytes=32 time=2ms TTL=125

Reply from 40.0.0.1: bytes=32 time=4ms TTL=125

Reply from 40.0.0.1: bytes=32 time=4ms TTL=125

Ping statistics for 40.0.0.1:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 2ms, Maximum = 2lms, Average = 9ms

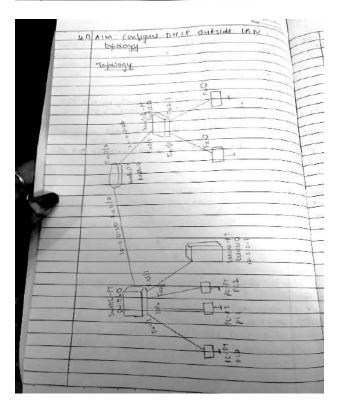
PC>
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Configure DHCP within a LAN and outside LAN.

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11/10	A tim To configure DHCP within a LAN and	
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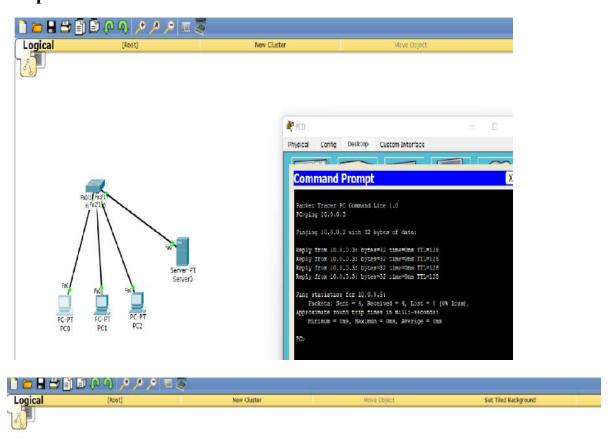
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9	e them to repeat above step in per and PCE the IP admin will be 10003
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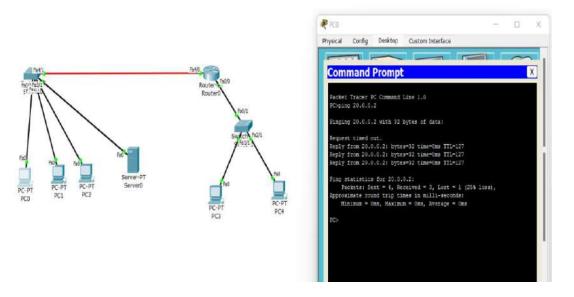
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	Observation
_	ond PC2 in the LAN network when we enable DHCP protocol.
_	This has application when large network
_	to all PCs gatway is autimatically set t



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DurnPoga
7. In Destrop mode of PC3 and PC4 select 6 AV DHCP and they will automatically be arrighed 10 address as 20-06-2 and
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Imaging statistics for 20.0.0.2 Imaging statistics for 20.0.0.2 I auth cent = 4. Featherd = 4. lost = 0.01/20. Approximate round trip time in milli-second Approximate round trip time in milli-second
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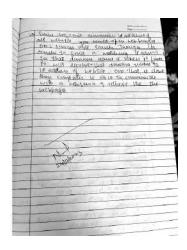


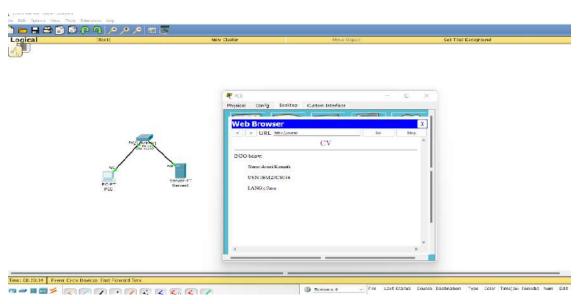


Configure Web Server, DNS within a LAN

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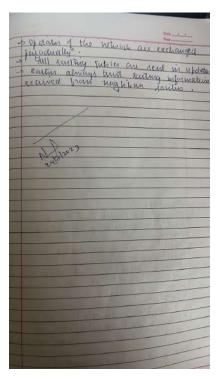


Configure RIP routing Protocol in Routers

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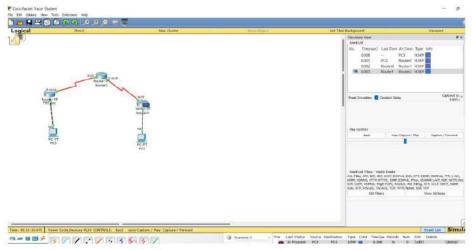
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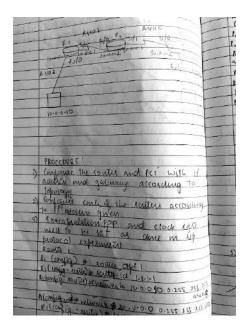


Output

Command Prompt Packet Tracer FC Command Line 1.0 PC>ping 40.0.0.1 Pinging 40.0.0.1 with 32 bytes of data: Request timed out. Reply from 40.0.0.1: bytes=32 time=13ms TTL=125 Reply from 40.0.0.1: bytes=32 time=4ms TTT=125 Reply from 40.0.0.1: bytes=32 time=14ms TTL=125 Ping statistics for 40.0.0.1: Fackets: Sent = 4, Received = 3, Lost = 1 (25% loss), Approximate round trip times in milli-seconds: Minimum = 4ms, Maximum = 14ms, Average = 10ms PC>

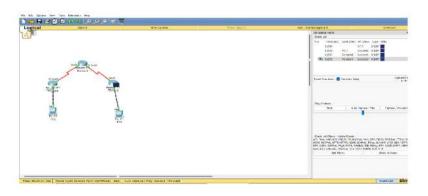


Configure OSPF routing protocol

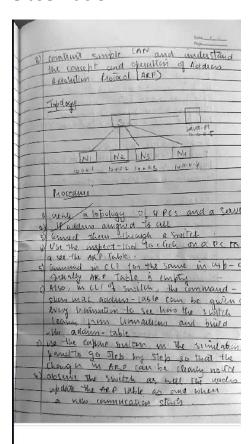


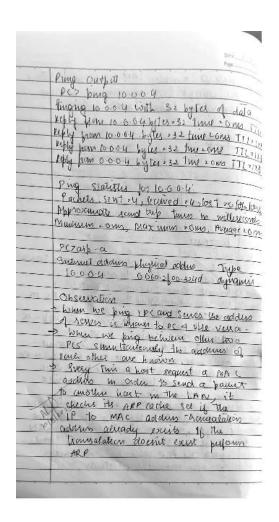


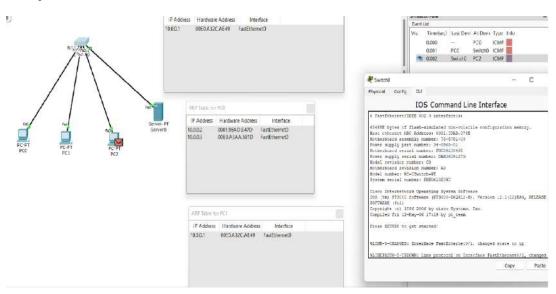
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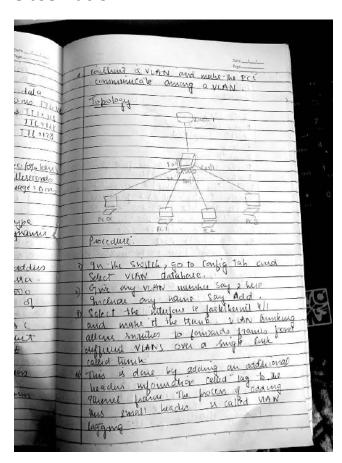
construct simple LAN and understand the concept and operation of Address Resolution Protocol (ARP)





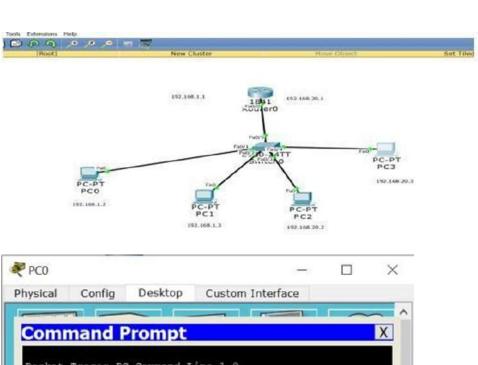


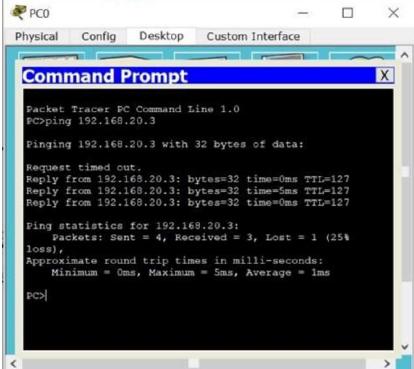
To construct a VLAN and make a pc communicate among VLAN



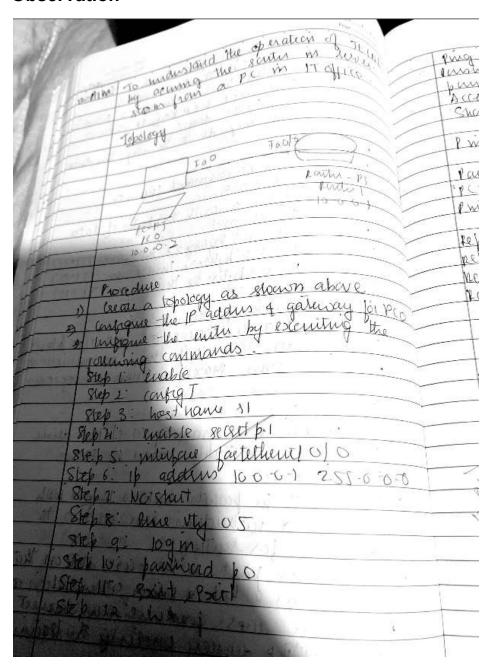
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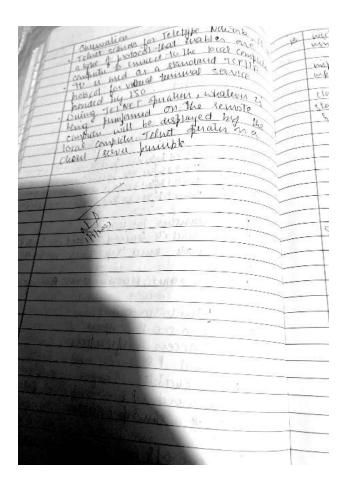


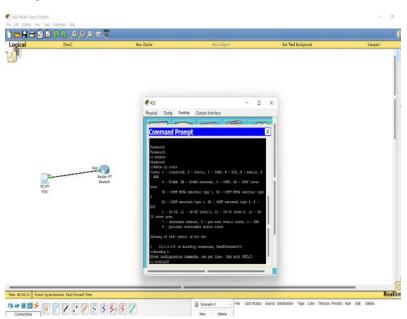


To understand the operation of TELNET by accessing the router in server room from a PC in IT office

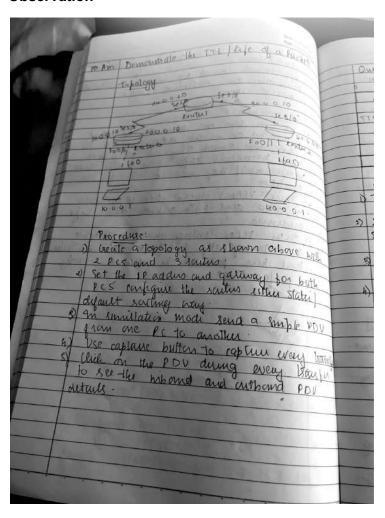


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prigning 10.0.0.1 with 32 buter of date
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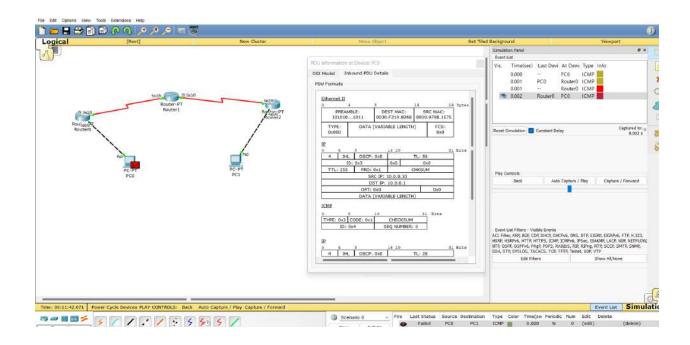




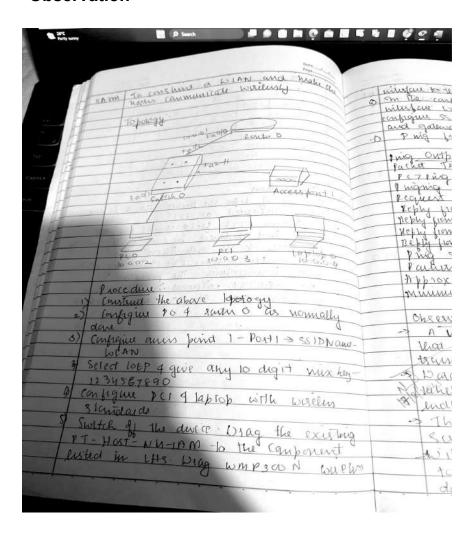
Demonstrate the TTL/ Life of a Packet

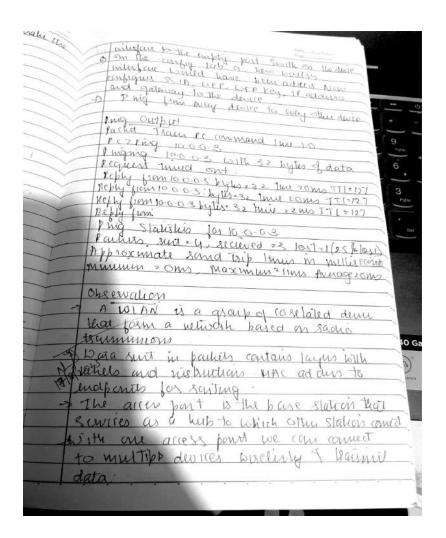


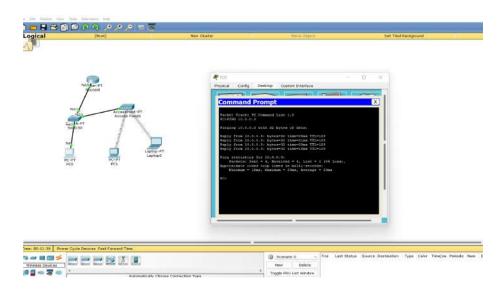
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To construct a WLAN and make the nodes communicate wirelessly.







```
Write a program for error detecting code using CRC-
 CCITT (16-bits).
code
import java.util.Scanner;
import java.util.Arrays; class Program { static String Xor(String a, String b) {
String result = "";
int n = b.length();
for (int i = 1; i < n; i++)
{ result=(a.charAt(i) == b.charAt(i))?0:1;
} return result;
} static String Div(String data, String key)
{ int pick = key.length();
String tmp = data.substring(0, pick);
int n = data.length();
while (pick < n)
{ if (tmp.charAt(0) == '1') tmp = Xor(data, tmp) + data.charAt(pick);
else tmp = Xor(new String(new char[pick]).replace("\0", "0"), tmp) +
data.charAt(pick); pick += 1;
}
if (tmp.charAt(0) == '1') tmp = Xor(divisor, tmp);
else
```

```
tmp = Xor(new String(new char[pick]).replace("\0", "0"), tmp);
return tmp;
}
static void Encode(String data, String key)
{ int lkey = key.length();
String appended data = (data + new String(new char[lkey -
1]).replace("\0", "0"));
String remainder = Mod2Div(appended_data, key); String codeword = data
+ remainder;
System.out.println("Remainder : " + remainder);
System.out.println("Encoded Data (Data + Remainder):" + codeword +
"\n");
}
public static void main(String[] args)
{ Scanner s = new Scanner(System.in);
 System.out.println("enter dataword and key");
String data = s.next();
String key = s.next();
EncodeData(data, key);
}
}
```

18 with a program for exer detecting uring crc import Java util Scouring mpart java util Arrays clay Program & statu String x08 (String a, string Steing went - " " for (not i=1; i < n; i++) segult = (a. charA+[i] = 2 b. (harA+(i)) 20:1. seturn sesult) Statu Sterng Dir (Stung data, Sting key = kly, length () Sting trup = data Substing int no data length () while I pink in & if I temp charact (0) trup = x01 (data, tamp) data charat pick); else trop= xor (new string (new char (" 10" (pinh) · seplace return temp 3 Vold Enjode String z key-length

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sung remarried 2 per 1:
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System out builty ("Remaindy" + remaindy
String remarious = Mod 2 Dw [appended date key); String codeword = data + remarious; System out - printly ("remaindus": "+ remarious! System out - printly ("facocad Data (pata + Remaindus): "+ codeword + "In");
(vata + Remaindu): "+ codeword + "In') public static void main (string 1) args)
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Write a program for congestion control using Leaky bucket algorithm.

code

```
import java.util.*;
class Leakybucket
public static void main(String[] args)
int rem;
Scanner sc=new Scanner(System.in);
int s= 0;
System.out.println("enter no of queries, buffer size, input and output
packet size ");
int q=sc.nextInt();
int bs=sc.nextInt();
int ip=sc.nextInt();
int op=sc.nextInt();
for (int i = 0; i < q; i++)
{
rem=bs-s;
if (ip <= (rem))
System.out.println("packet is accepted");
s+=ip;
} else
{
System.out.println("Packet not accepted ");
System.out .println("remaining space="+(bs-s)); s -= op;
}
```

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14 write a program for control using leavy b	
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public static void ma args)	in (Sting)
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enter no of queries, buffer size, input and output packet size
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remaining space=4
Packet not accepted
remaining space=5
packet is accepted
remaining space=0
Packet not accepted
remaining space=1
```

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.

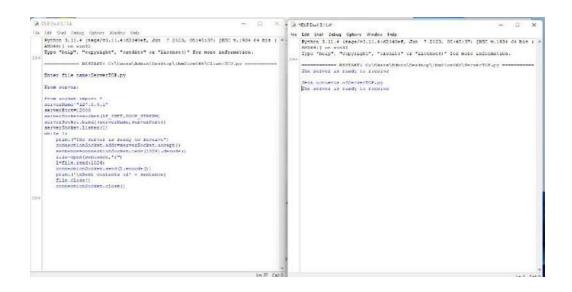
```
ClientTCP.py
from socket import *
serverName=
'127.0.0.1'
serverPort = 12000
clientSocket=socket(AF_INET,
SOCK_STREAM)
clientSocket.connect((serverName,server
Port)) sentence = input("\nEnter file
name:
                              ")
clientSocket.send(sentence.encode())
filecontents=
clientSocket.recv(1024).decode() print
('\nFromServer:\n')
print(filecontents)
clientSocket.close()
ServerTCP.py
        socket
                 import*
from
serverName="127.0.0
.1" serverPort= 12000
serverSocket=
socket(AF_INET,SOCK_STREAM)
```

```
serverSocket.bind((serverName,server
Port)) serverSocket.listen(1)
while 1:
print ("The server is ready to
receive")
                connectionSocket,
                                   addr=
serverSocket.accept()sentence=
connectionSocket.recv(1024).decode()
file=open(sentence,&quot
;r") I=file.read(1024)
connectionSocket.send(l.e
ncode())
print ('\nSent contents of ' +
sentence) file.close()
connectionSocket.close()
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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.

```
code
ClientUDP.py
from socket import *
serverName =
"127.0.0.1"
serverPort = 12000
clientSocket = socket(AF_INET,
SOCK_DGRAM) sentence =
input("\nEnter file name: ")
clientSocket.sendto(bytes(sentence,"utf-8"),(serverNa
me, serverPort)) filecontents, serverAddress =
clientSocket.recvfrom(2048)
print ('\nReply from
Server:\n') print
(filecontents.decode("utf-8
")) # for i in filecontents:
# print(str(i), end =
'')
clientSocket.close()
clientSocket.close()
ServerUDP.py
```

```
from
socket
import *
serverPort
= 12000
serverSocket = socket(AF_INET,
SOCK_DGRAM)
serverSocket.bind(("127.0.0.1&quo
t;, serverPort)) print ("The server is
ready to receive") while 1:
sentence, clientAddress =
serverSocket.recvfrom(2048) sentence =
sentence.decode("utf-8")
file=open(sentence,"r")
con=file.read(2048)
serverSocket.sendto(bytes(con,"utf-8"
),clientAddress) print ('\nSent contents of
', end = ' ')
print (sentence)
# for i in sentence:
# print (str(i), end =
'')
file.close()
```

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