

The screenshot shows a web browser window with multiple tabs. The active tab is 'cocalc.com/projects/9dd38543-0479-4362-968a-80d1c6fd2d52/files/lab.term?session=default'. A red banner at the top of the browser window contains a 'Free Trial (Day 0)' message and a link to 'buy a license'. Below the banner, the browser's address bar and tabs are visible. The main content area shows a terminal window titled 'lab.term' with the following output:

```
- $ ./bitstuff
bash: ./bitstuff: No such file or directory
- $ ./a.out
Enter the number of bits of the message
19
Enter the bits
01011111001111001
^C
- $ ./a.out
Enter the number of bits of the message
19
Enter the bits
0
1
0
1
1
1
1
1
1
0
0
1
1
1
1
1
The length is: 36
The frame is
01111100101111010011110010111110
```

The terminal window is part of a web application interface with a menu bar (File, New, Log, Find, Settings, Processes, lab.term) and a toolbar (File, Pause, Copy, Paste, Guide, Help, ~). The Windows taskbar at the bottom shows the search bar, task view, and various application icons, including the browser, file explorer, and system tray with weather and time information (28°C, AQI 168, 14:16, 06-08-2021).

1. Bit stuff

2.byte stuff

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```
- $ ./a.out
How many frames you want to send: 19
Enter frame
0
String length of buffer is 1
Enter frame
1
String length of buffer is 1
Enter frame
^C
- $ - $
- $ ./a.out
How many frames you want to send: 2
Enter frame
hello
String length of buffer is 5
Enter frame
hi
String length of buffer is 2
ehello3hi

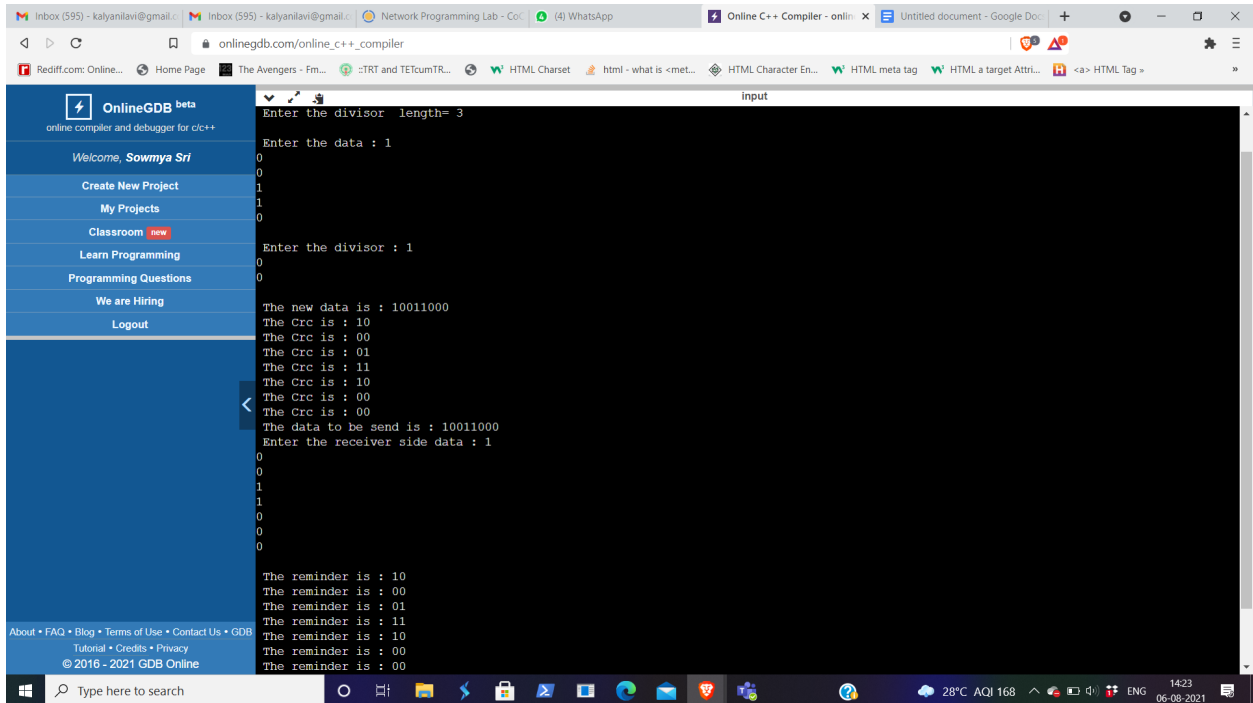
This is the reciever
Data recieved is ehello3hi
Length of this frame is 6

Frame ----->hello

Length of this frame is 3
Frame ----->hi
```

The terminal window is part of a web application interface with a menu bar (File, New, Log, Find, Settings, Processes, lab.term) and a toolbar (File, Pause, Copy, Paste, Guide, Help, ~). The Windows taskbar at the bottom shows the search bar, task view, and various application icons, including the browser, file explorer, and system tray with weather and time information (28°C, AQI 168, 14:18, 06-08-2021).

3.crc



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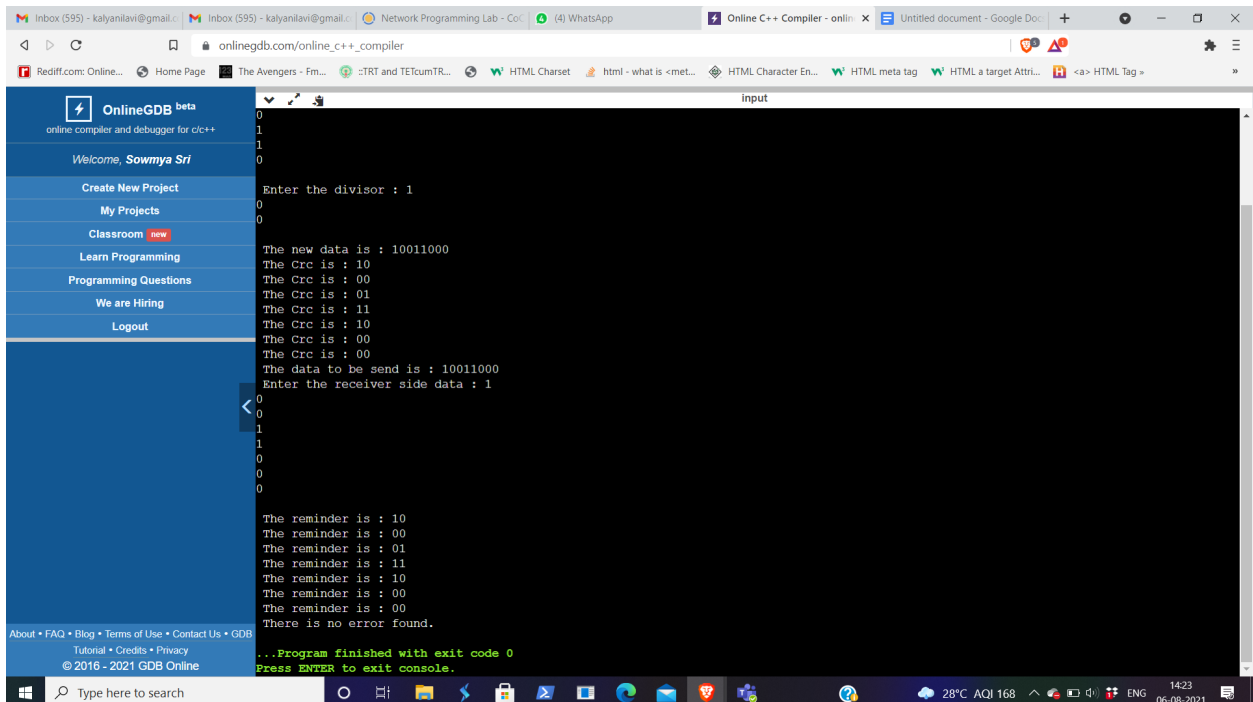
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```
input
Enter the divisor length= 3
Enter the data : 1
0
0
1
1
0
0
Enter the divisor : 1
0
0
0
The new data is : 10011000
The Crc is : 10
The Crc is : 00
The Crc is : 01
The Crc is : 11
The Crc is : 10
The Crc is : 00
The Crc is : 00
The data to be send is : 10011000
Enter the receiver side data : 1
0
0
1
1
0
0
0
0
The remainder is : 10
The remainder is : 00
The remainder is : 01
The remainder is : 11
The remainder is : 10
The remainder is : 00
The remainder is : 00
```



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```
input
Enter the divisor : 1
0
0
0
The new data is : 10011000
The Crc is : 10
The Crc is : 00
The Crc is : 01
The Crc is : 11
The Crc is : 10
The Crc is : 00
The Crc is : 00
The data to be send is : 10011000
Enter the receiver side data : 1
0
0
1
1
0
0
0
0
The remainder is : 10
The remainder is : 00
The remainder is : 01
The remainder is : 11
The remainder is : 10
The remainder is : 00
The remainder is : 00
There is no error found.
...Program finished with exit code 0
Press ENTER to exit console.
```

4 Tcp

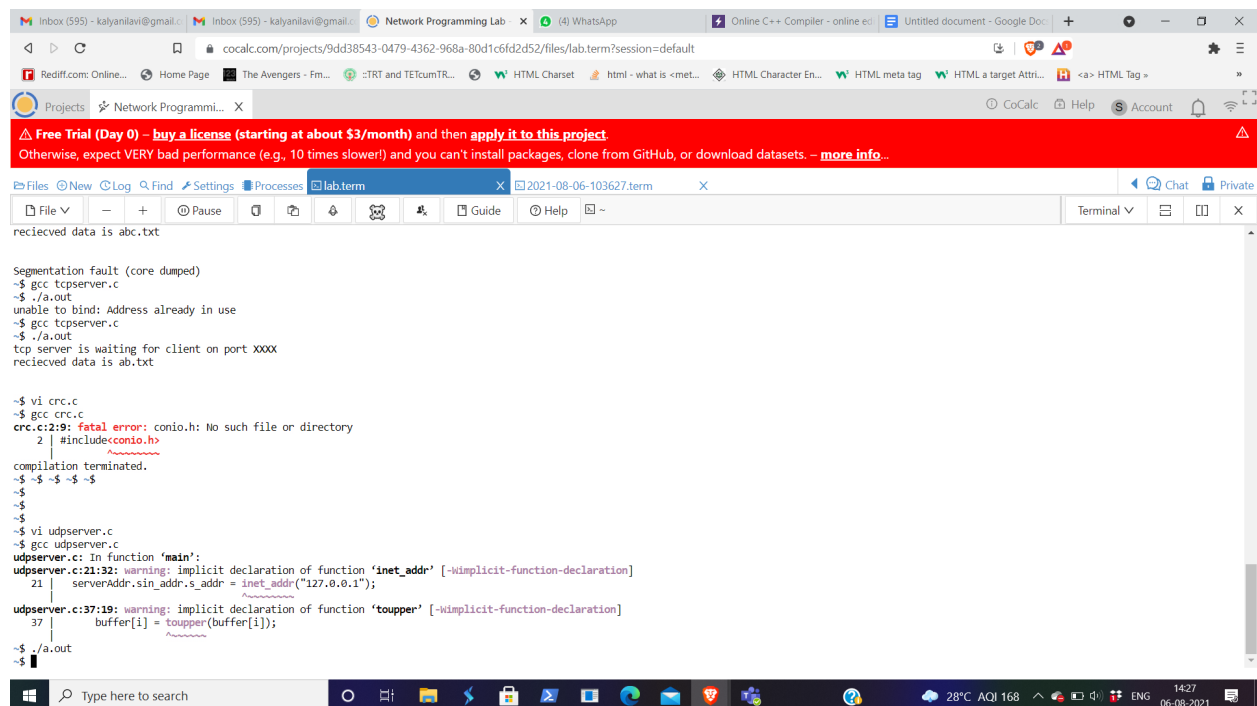
Tcp server

[illegible]

Tcp client

5.udp

Udp server

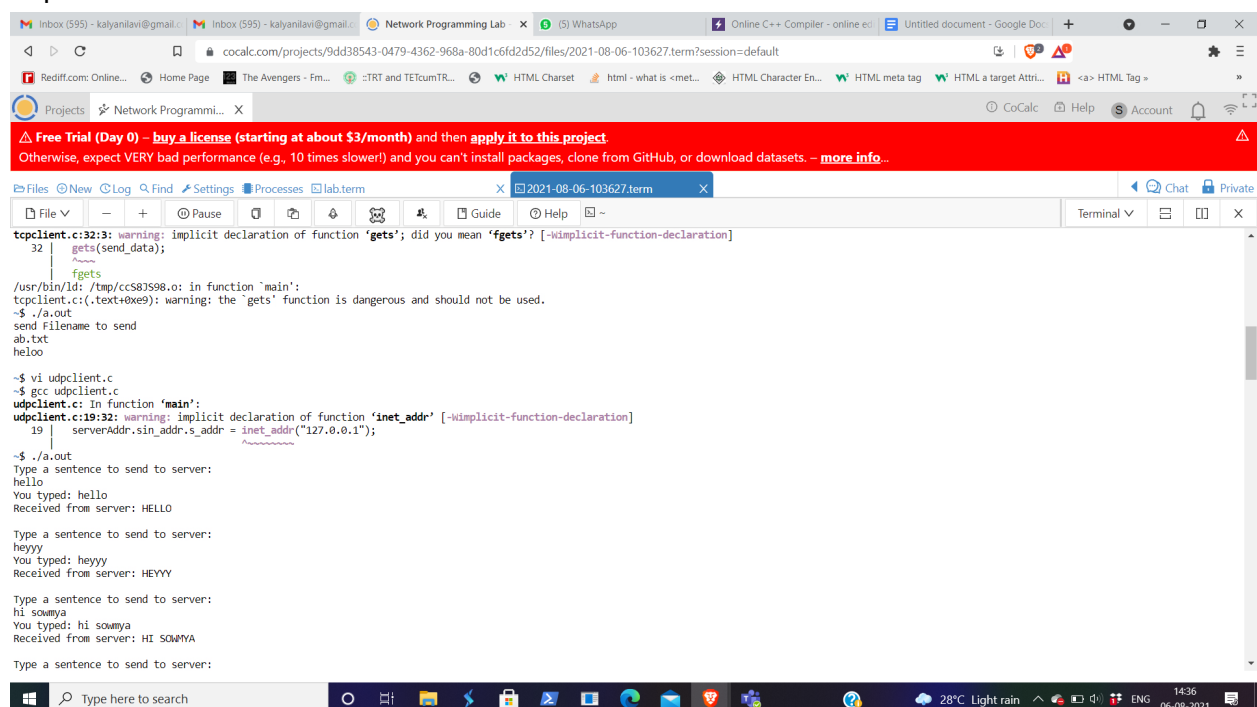


The screenshot shows a web-based C++ IDE interface. At the top, there's a red banner for a "Free Trial (Day 0)" with a link to "buy a license". Below the banner, the IDE has tabs for "Files", "New", "Log", "Find", "Settings", "Processes", and "lab.term". The "lab.term" tab is active, showing a terminal window. The terminal output shows the compilation and execution of a UDP server program. The program is named "udpserver.c" and is located in the directory "/tmp/cc583598.o". The output shows the program is waiting for a client on port XXXX and receives data "ab.txt".

```
Segmentation fault (core dumped)
-$ gcc tcpserver.c
-$ ./a.out
unable to bind: Address already in use
-$ gcc tcpserver.c
-$ ./a.out
tcp server is waiting for client on port XXXX
recieved data is ab.txt

-$ vi crc.c
-$ gcc crc.c
crc.c:2:9: fatal error: conio.h: No such file or directory
  2 | #include<conio.h>
    | ^~~~~~
compilation terminated.
-$ $- $- $- $-
-$
-$
-$
-$ vi udpserver.c
-$ gcc udpserver.c
udpserver.c: In function 'main':
udpserver.c:21:32: warning: implicit declaration of function 'inet_addr' [-Wimplicit-function-declaration]
   21 |     serverAddr.sin_addr.s_addr = inet_addr("127.0.0.1");
      |                                ^~~~~~
udpserver.c:37:19: warning: implicit declaration of function 'toupper' [-Wimplicit-function-declaration]
   37 |     buffer[i] = toupper(buffer[i]);
      |                   ^~~~~~
-$ ./a.out
-$
```

Udp client



The screenshot shows a web-based C++ IDE interface. At the top, there's a red banner for a "Free Trial (Day 0)" with a link to "buy a license". Below the banner, the IDE has tabs for "Files", "New", "Log", "Find", "Settings", "Processes", and "lab.term". The "lab.term" tab is active, showing a terminal window. The terminal output shows the compilation and execution of a UDP client program. The program is named "udpclient.c" and is located in the directory "/tmp/cc583598.o". The output shows the program sending data "ab.txt" and receiving "HELLO" from the server. The user interacts with the program by typing "hello", "heyyy", and "hi soumya", and the program responds with "HELLO", "HEYYY", and "HI SOU@MYA".

```
udpclient.c:32:3: warning: implicit declaration of function 'gets'; did you mean 'fgets'? [-Wimplicit-function-declaration]
   32 |     gets(send_data);
      |     ^~~~~
      |     fgets
/usr/bin/ld: /tmp/cc583598.o: in function 'main':
udpclient.c:(.text+0xe9): warning: the 'gets' function is dangerous and should not be used.
-$ ./a.out
send filename to send
ab.txt
hello

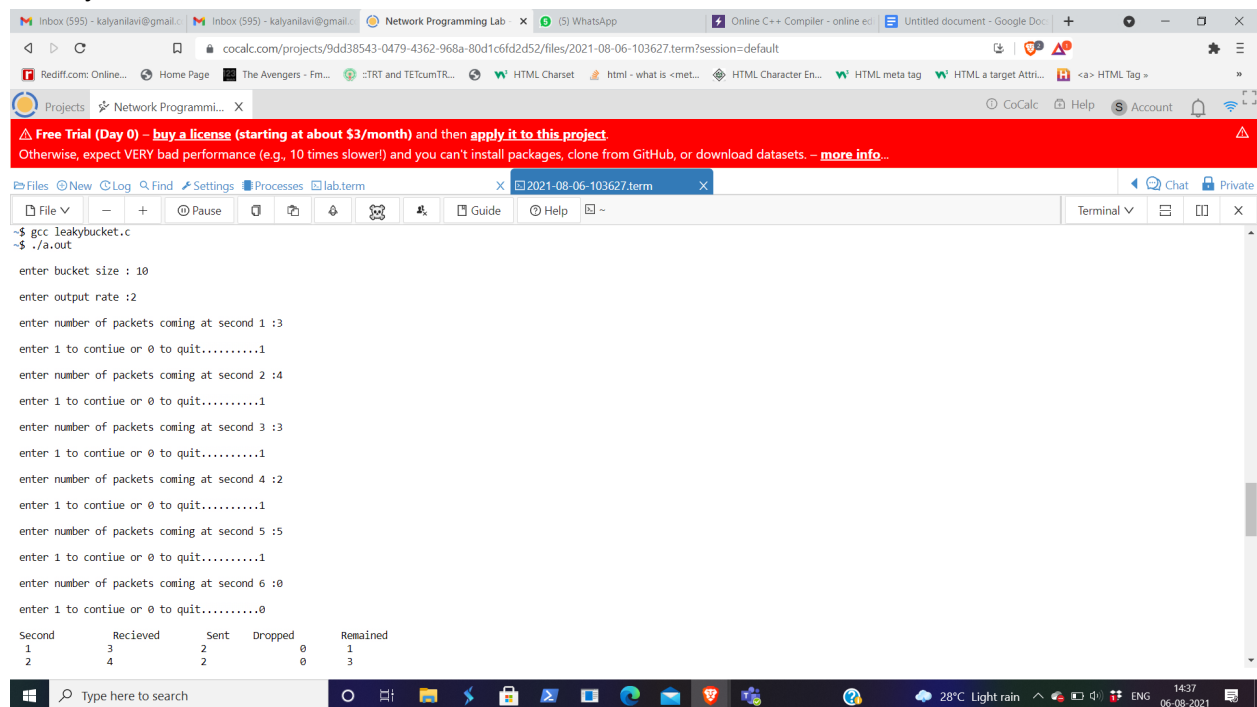
-$ vi udpclient.c
-$ gcc udpclient.c
udpclient.c: In function 'main':
udpclient.c:19:32: warning: implicit declaration of function 'inet_addr' [-Wimplicit-function-declaration]
   19 |     serverAddr.sin_addr.s_addr = inet_addr("127.0.0.1");
      |                                ^~~~~~
-$ ./a.out
Type a sentence to send to server:
hello
You typed: hello
Received from server: HELLO

Type a sentence to send to server:
heyyy
You typed: heyyy
Received from server: HEYYY

Type a sentence to send to server:
hi soumya
You typed: hi soumya
Received from server: HI SOU@MYA

Type a sentence to send to server:
```

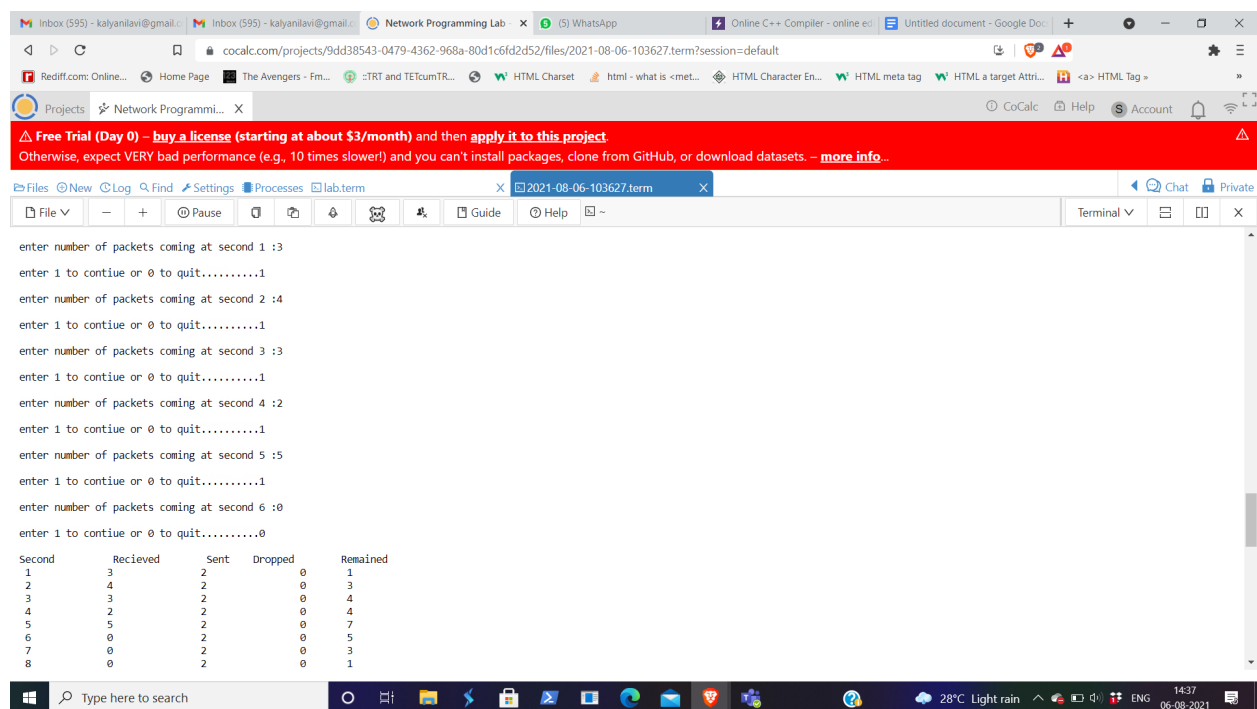
6 leaky bucket



```
$ gcc leakybucket.c
$ ./a.out

enter bucket size : 10
enter output rate : 2
enter number of packets coming at second 1 : 3
enter 1 to continue or 0 to quit.....1
enter number of packets coming at second 2 : 4
enter 1 to continue or 0 to quit.....1
enter number of packets coming at second 3 : 3
enter 1 to continue or 0 to quit.....1
enter number of packets coming at second 4 : 2
enter 1 to continue or 0 to quit.....1
enter number of packets coming at second 5 : 5
enter 1 to continue or 0 to quit.....1
enter number of packets coming at second 6 : 0
enter 1 to continue or 0 to quit.....0

Second      Recieved      Sent      Dropped      Remained
1            3            2           0           1
2            4            2           0           3
3            3            2           0           4
4            2            2           0           4
5            5            2           0           7
6            0            2           0           5
7            0            2           0           3
8            0            2           0           1
```



```
enter number of packets coming at second 1 : 3
enter 1 to continue or 0 to quit.....1
enter number of packets coming at second 2 : 4
enter 1 to continue or 0 to quit.....1
enter number of packets coming at second 3 : 3
enter 1 to continue or 0 to quit.....1
enter number of packets coming at second 4 : 2
enter 1 to continue or 0 to quit.....1
enter number of packets coming at second 5 : 5
enter 1 to continue or 0 to quit.....1
enter number of packets coming at second 6 : 0
enter 1 to continue or 0 to quit.....0

Second      Recieved      Sent      Dropped      Remained
1            3            2           0           1
2            4            2           0           3
3            3            2           0           4
4            2            2           0           4
5            5            2           0           7
6            0            2           0           5
7            0            2           0           3
8            0            2           0           1
```

7. Distance vector

```
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Files | New | Log | Find | Settings | Processes | lab.term | 2021-08-06-103627.term | Chat | Private
File | - | + | Pause | | | | | Guide | Help | ~
0
-$ vi distancevector.c
-$ gcc distancevector.c
-$ ./a.out

Enter the number of nodes: 5

Enter the cost matrix
-$ 0 1 5 99 99
bash: 0: command not found
-$ gcc distancevector.c
-$ ./a.out

Enter the number of nodes: 5

Enter the cost matrix
0 1 5 99 99
1 0 3 99 9
5 3 0 4 99
99 99 4 0 2
99 9 99 2 0

State value for router 1 is

Node   Via   Dist.
1       1     0
2       2     1
3       2     4
4       3     8
5       2    10

State value for router 2 is
```

```
Windows | Type here to search | 28°C Light rain | 14:37 06-08-2021
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Files | New | Log | Find | Settings | Processes | lab.term | 2021-08-06-103627.term | Chat | Private
File | - | + | Pause | | | | | Guide | Help | ~

State value for router 2 is

Node   Via   Dist.
1       1     1
2       2     0
3       3     3
4       3     7
5       5     9

State value for router 3 is

Node   Via   Dist.
1       2     4
2       2     3
3       3     0
4       4     4
5       4     6

State value for router 4 is

Node   Via   Dist.
1       3     8
2       3     7
3       3     4
4       4     0
5       5     2

State value for router 5 is

Node   Via   Dist.
1       2    10
2       2     9
3       4     6
```

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Files | New | Log | Find | Settings | Processes | lab.term | X | 2021-08-06-103627.term | X | Chat | Private

File | - | + | Pause | | | | | Guide | Help | ~

```
1 1 1
2 2 0
3 3 3
4 3 7
5 5 9

State value for router 3 is

Node Via Dist.
1 2 4
2 2 3
3 3 0
4 4 4
5 4 6

State value for router 4 is

Node Via Dist.
1 3 8
2 3 7
3 3 4
4 4 0
5 5 2

State value for router 5 is

Node Via Dist.
1 2 10
2 2 9
3 4 6
4 4 2
5 5 0

~$
```

Type here to search | 28°C Light rain | 14:38 | 06-08-2021