Advanced Networking Assignment
(Network Simulator)

Semester 2

Paper: Advanced Networking Laboratory

Subject: Computer Application

Course: MCA (2 years)

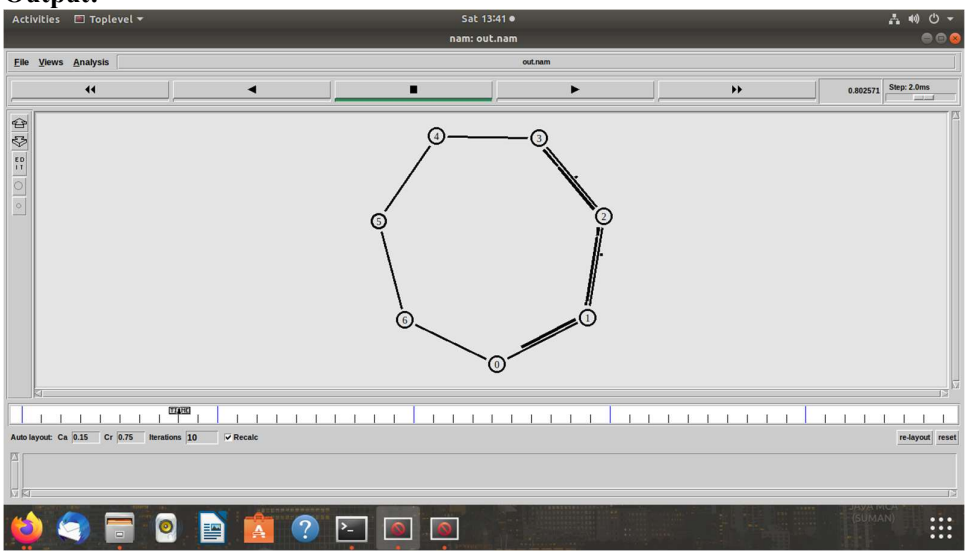
University of Calcutta

Name	Registration No.	Roll Number
Swarnadeep Das	A03-1112-0175-20	C91/MCA/232032

1. **TCP, FTP**

```
set ns [new Simulator]
set nf [open ass1.nam w]
set f [open ass1.tr w]
$ns namtrace-all $nf
$ns trace-all $f
$ns rtproto Session
proc finish {} {
        global ns f
        $ns flush-trace
        close $f
        exec nam ass1.nam &
        exit 0
}
set n(1) [$ns node]
set n(2) [$ns node]
set n(3) [$ns node]
set n(4) [$ns node]

$n(2) color red
$n(4) color blue
$ns simplex-link $n(1) $n(2) 10Mb 5ms SFQ
$ns simplex-link $n(2) $n(3) 10Mb 5ms SFQ
$ns duplex-link $n(3) $n(4) 20Mb 10ms DropTail
$ns duplex-link $n(4) $n(1) 20Mb 10ms DropTail

set tcp0 [new Agent/TCP]
$ns attach-agent $n(2) $tcp0
set sink [new Agent/TCPSink]
$ns attach-agent $n(4) $sink
$ns connect $tcp0 $sink
$tcp0 set fid_ 2
$tcp0 set packetsize_ 1024
$tcp0 set random_ true
$tcp0 set rate_ 0.02Mb

set ftp0 [new Application/FTP]
$ftp0 attach-agent $tcp0
$ftp0 set type_ FTP

$ns at 0.0 "$ftp0 start"
$ns at 1.0 "$ftp0 stop"
$ns at 10.0 "finish"
$ns run
```

Output:

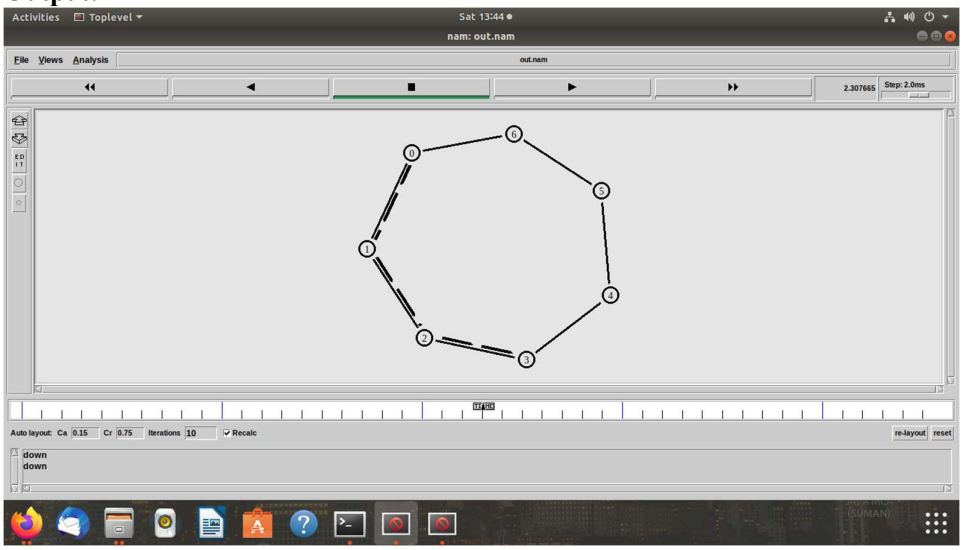


2. **UDP, CBR**

```
set ns [new Simulator]
set nf [open ass1.nam w]
set f [open ass1.tr w]
$ns namtrace-all $nf
$ns trace-all $f
$ns rtproto Session

proc finish {} {

        global ns f
        $ns flush-trace
        close $f
        exec nam ass1.nam &
        exit 0
}

set n(1) [$ns node]
set n(2) [$ns node]
set n(3) [$ns node]
set n(4) [$ns node]

$n(2) color red
$n(4) color blue


$ns simplex-link $n(1) $n(2) 10Mb 5ms SFQ
$ns simplex-link $n(2) $n(3) 10Mb 5ms SFQ
$ns duplex-link $n(3) $n(4) 20Mb 10ms DropTail
$ns duplex-link $n(4) $n(1) 20Mb 10ms DropTail

set udp0 [new Agent/UDP]
$ns attach-agent $n(2) $udp0
```

```
set null [new Agent/Null]
$ns attach-agent $n(4) $null
$ns connect $udp0 $null
$udp0 set fid_ 2

set cbr0 [new Application/Traffic/CBR]
$cbr0 attach-agent $udp0
$cbr0 set packetsize_ 512
$cbr0 set rate_ 0.01Mb
$cbr0 set random_ false

$ns at 0.0 "$cbr0 start"
$ns at 1.0 "$cbr0 stop"
$ns at 10.0 "finish"
$ns run
```

Output:

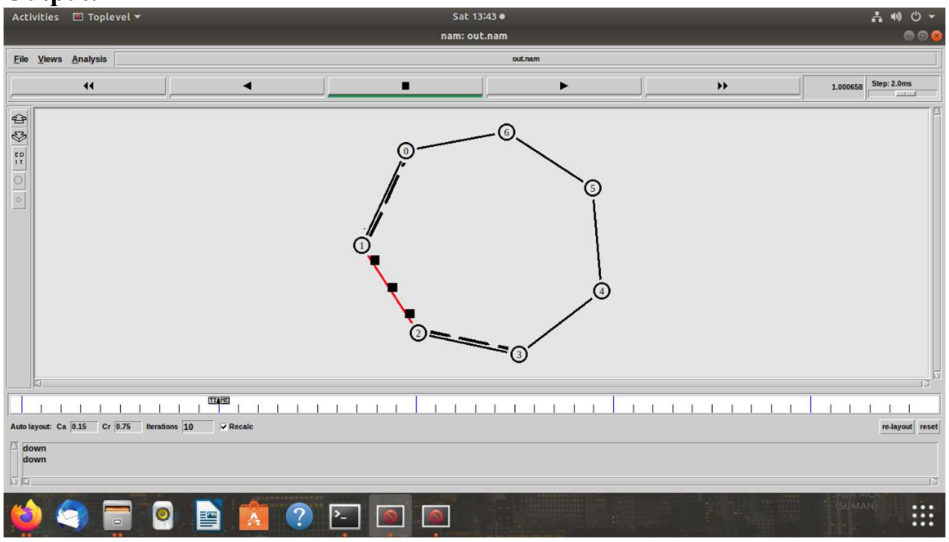


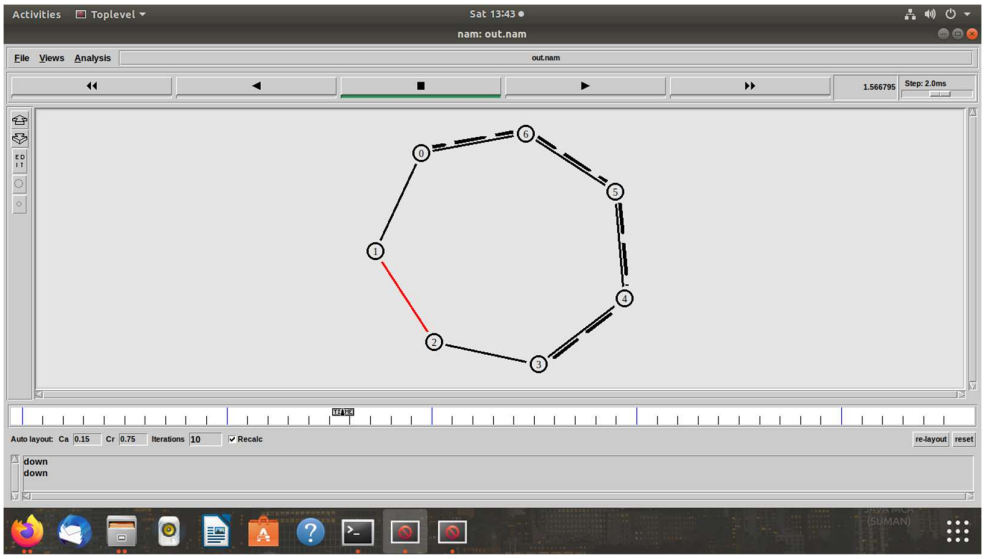
3. **Dynamic link failure (UDP):**

```
set ns [new Simulator]
$ns rtproto DV

set nf [open out.nam w]
$ns namtrace-all $nf

proc finish {} {
global ns nf
$ns flush-trace
close $nf
exec nam out.nam &
exit 0
}

for {set i 0} {$i<7} {incr i} {
set n($i) [$ns node]
```

```
}

for {set i 0} {$i<7} {incr i} {
$ns duplex-link $n($i) $n([expr ($i+1)%7]) 1Mb 10ms DropTail
}

set udp0 [new Agent/UDP]
$ns attach-agent $n(0) $udp0

set cbr0 [new Application/FTP]
$cbr0 set packetSize_ 500
$cbr0 set interval_ 0.005
$cbr0 attach-agent $udp0

set sink [new Agent/Null]
$ns attach-agent $n(3) $sink
$ns connect $udp0 $sink

$ns at 0.5 "$cbr0 start"
$ns rtmodel-at 1.0 down $n(1) $n(2)
$ns rtmodel-at 2.0 up $n(1) $n(2)
$ns at 4.5 "$cbr0 stop"
$ns at 5.0 "finish"
$ns run
```

Output:



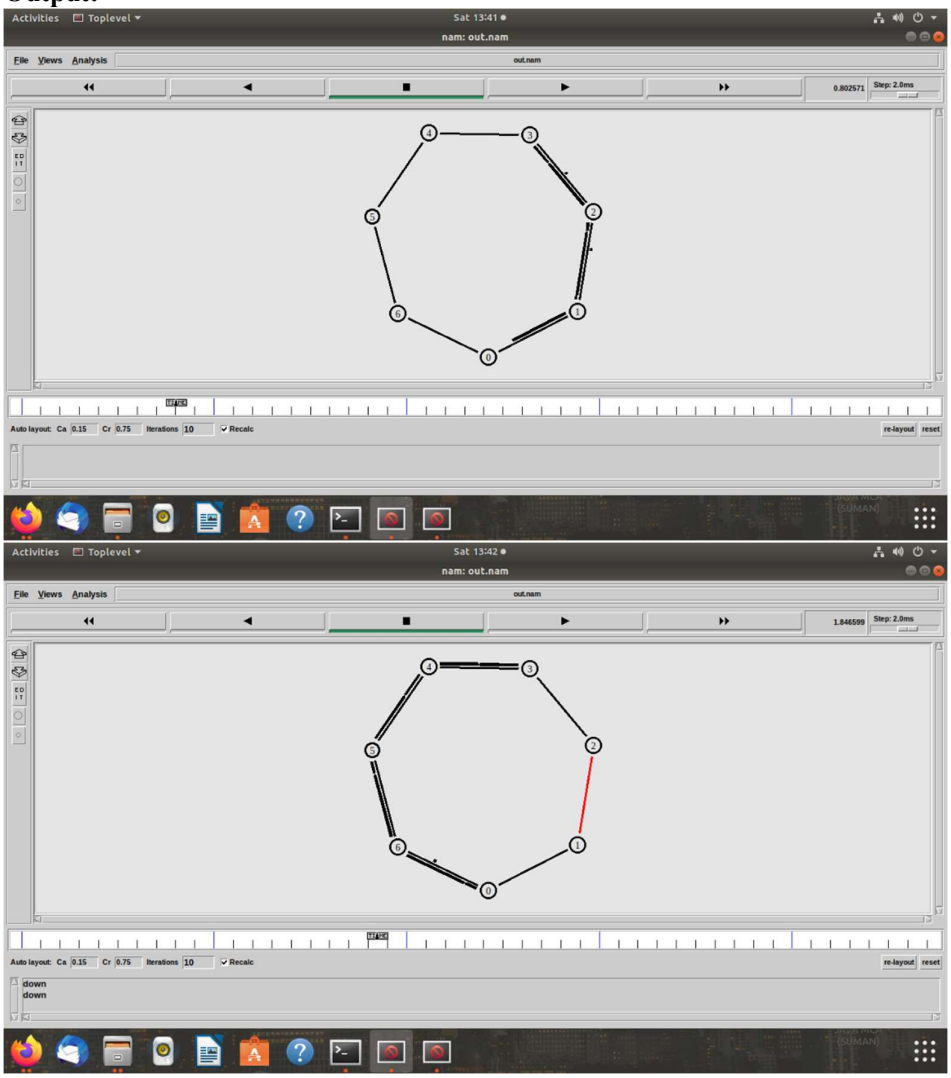


4. **Dynamic Link Failure (TCP):**

```
set ns [new Simulator]
$ns rtproto DV

set nf [open out.nam w]
$ns namtrace-all $nf

proc finish {} {
global ns nf
$ns flush-trace
close $nf
exec nam out.nam &
exit 0
}

for {set i 0} {$i<7} {incr i} {
set n($i) [$ns node]
}

for {set i 0} {$i<7} {incr i} {
$ns duplex-link $n($i) $n([expr ($i+1)%7]) 1Mb 10ms DropTail
}

set tcp0 [new Agent/TCP]
$ns attach-agent $n(0) $tcp0

set cbr0 [new Application/FTP]
$cbr0 set packetSize_ 500
$cbr0 set interval_ 0.005
$cbr0 attach-agent $tcp0

set sink [new Agent/TCPSink]
$ns attach-agent $n(3) $sink
$ns connect $tcp0 $sink
```

```
$ns at 0.5 "$cbr0 start"
$ns rtmodel-at 1.0 down $n(1) $n(2)
$ns rtmodel-at 2.0 up $n(1) $n(2)
$ns at 4.5 "$cbr0 stop"
$ns at 5.0 "finish"
$ns run
```

Output:



5. **TCP, FTP & UDP, CBR Together with 2 different fid and dynamic link failure**

```
set ns [new Simulator]
set nf [open ass1.nam w]
set f [open ass1.tr w]
```

```
$ns namtrace-all $nf
$ns trace-all $f
$ns rtproto Session

proc finish {} {
        global ns f
        $ns flush-trace
        close $f
        exec nam ass1.nam &
        exit 0
        }

set n(1) [$ns node]
set n(2) [$ns node]
set n(3) [$ns node]
set n(4) [$ns node]
set n(5) [$ns node]


$ns duplex-link $n(1) $n(2) 20Mb 10ms DropTail
$ns duplex-link $n(1) $n(3) 20Mb 10ms DropTail
$ns duplex-link $n(2) $n(3) 20Mb 10ms DropTail
$ns duplex-link $n(3) $n(5) 10Mb 5ms DropTail
$ns duplex-link $n(4) $n(5) 10Mb 5ms DropTail
$ns duplex-link $n(2) $n(4) 10Mb 5ms DropTail

set tcp0 [new Agent/TCP]
$ns attach-agent $n(1) $tcp0
set sink [new Agent/TCPSink]
$ns attach-agent $n(5) $sink
$ns connect $tcp0 $sink
$tcp0 set fid_ 1
$tcp0 set packetsize_ 1024
$tcp0 set random_ true
$tcp0 set rate_ 0.02Mb

set ftp0 [new Application/FTP]
$ftp0 attach-agent $tcp0
$ftp0 set type_ FTP

set udp [new Agent/UDP]
$ns attach-agent $n(2) $udp
set null [new Agent/Null]
$ns attach-agent $n(5) $null
$ns connect $udp $null
$udp set fid_ 2

set cbr [new Application/Traffic/CBR]
$cbr attach-agent $udp
$cbr set packetsize_ 512
$cbr set rate_ 0.01Mb
```

```
$cbr set random_ false

$ns at 10.0 "$ftp0 start"
$ns at 0.0 "$cbr start"
$ns rtmodel-at 5.0 down $n(1) $n(3)
$ns rtmodel-at 8.0 up $n(1) $n(3)
$ns rtmodel-at 10.0 down $n(2) $n(3)
$ns rtmodel-at 18.0 up $n(2) $n(3)
$ns at 20.0 "$ftp0 stop"
$ns at 10.0 "$cbr stop"
$ns at 50.0 "finish"
$ns run
```

Output: