

# CSP334: Computer Networks, Lab Assignment No 5, SOCKET PROGRAMMING IN C

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Entry No. : 2016UCS0028

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## 1: Writing brief note on some networking user defined structures

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It has been done and the answer is in file question1.txt

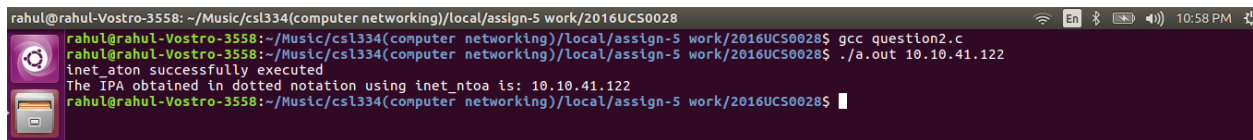
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## 2: question on using inet aton and inet ntoa

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It has been coded and the code is in file question2.c

**Screenshot (How to compile and how output should appear)**



```
rahul@rahul-Vostro-3558: ~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ gcc question2.c
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ ./a.out 10.10.41.122
inet_aton successfully executed
The IPA obtained in dotted notation using inet_ntoa is: 10.10.41.122
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$
```

Figure 1: inet ntoa and inet aton

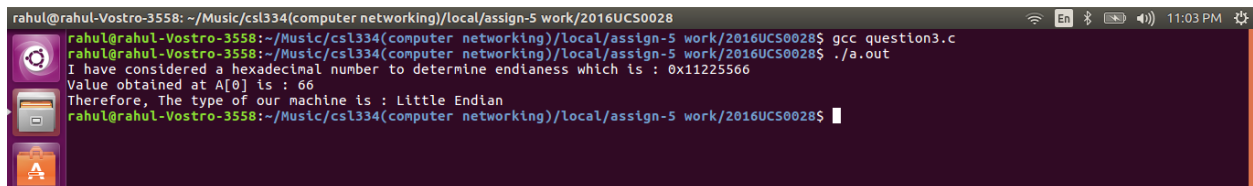
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## 3: question on checking endianness of a machine

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It has been coded and the code is in file question3.c

**Screenshot (How to compile and how output should appear)**



```
rahul@rahul-Vostro-3558: ~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ gcc question3.c
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ ./a.out
I have considered a hexadecimal number to determine endianness which is : 0x11225566
Value obtained at A[0] is : 66
Therefore, The type of our machine is : Little Endian
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$
```

Figure 2: Endianness of a machine

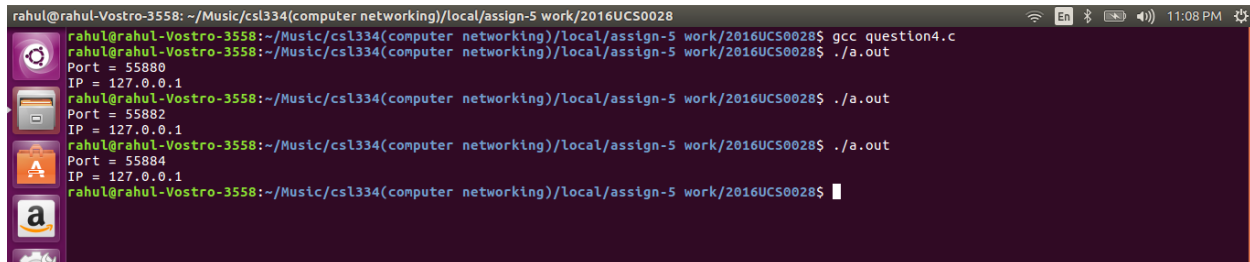
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#### 4: question on to show IPA and port number without using bind()

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It has been coded and the code is in file question4.c

Screenshot (How to compile and how output should appear)



```

rahul@rahul-Vostro-3558: ~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ gcc question4.c
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ ./a.out
Port = 55880
IP = 127.0.0.1
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ ./a.out
Port = 55882
IP = 127.0.0.1
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ ./a.out
Port = 55884
IP = 127.0.0.1
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$

```

Figure 3: using getsockname

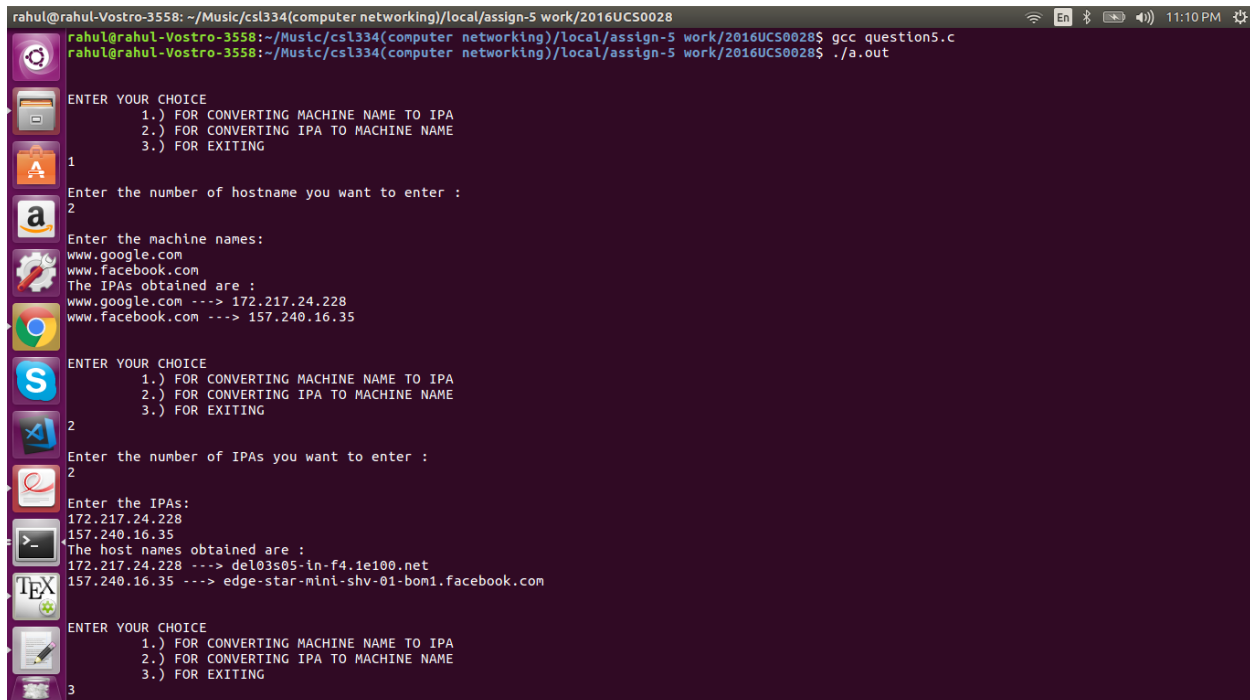
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#### 5: question on converting machine name into IPA and IPA to machine name

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It has been coded and the code is in file question5.c

Screenshot (How to compile and how output should appear)



```

rahul@rahul-Vostro-3558: ~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ gcc question5.c
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ ./a.out
ENTER YOUR CHOICE
1.) FOR CONVERTING MACHINE NAME TO IPA
2.) FOR CONVERTING IPA TO MACHINE NAME
3.) FOR EXITING
1
Enter the number of hostname you want to enter :
2
Enter the machine names:
www.google.com
www.facebook.com
The IPAs obtained are :
www.google.com ---> 172.217.24.228
www.facebook.com ---> 157.240.16.35
ENTER YOUR CHOICE
1.) FOR CONVERTING MACHINE NAME TO IPA
2.) FOR CONVERTING IPA TO MACHINE NAME
3.) FOR EXITING
2
Enter the number of IPAs you want to enter :
2
Enter the IPAs:
172.217.24.228
157.240.16.35
The host names obtained are :
172.217.24.228 ---> del03s05-lin-f4.1e100.net
157.240.16.35 ---> edge-star-mini-shv-01-bom1.facebook.com
ENTER YOUR CHOICE
1.) FOR CONVERTING MACHINE NAME TO IPA
2.) FOR CONVERTING IPA TO MACHINE NAME
3.) FOR EXITING
3

```

Figure 4: using hostname and IPA

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#### 6: question on modifying the TCP and UDP daytime service client illustrated in the lab

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It has been coded and the code is in file question6tcp.c (tcp part) and question6udp.c (udp part)

### Screenshot (How to compile and how output should appear)

```

rahul@rahul-Vostro-3558: ~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ gcc question6tcp.c
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ ./a.out 127.0.0.1
14 OCT 2018 23:11:42 IST
The hostname is : localhost
The port number of the server is: 13
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ ./a.out anything
14 OCT 2018 23:11:55 IST
$The hostname is not found please enter a valid IPA.
(For localhost you can use 127.0.0.1 as an IPA)
The port number of the server is: 13
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$

```

Figure 5: using tcp daytime client

```

rahul@rahul-Vostro-3558: ~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ gcc question6udp.c
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ ./a.out
usage: daytimecli1 <IPaddress>: Success
Segmentation fault (core dumped)
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ ./a.out 127.0.0.1
14 OCT 2018 23:13:12 IST
The hostname is : localhost
The port number of the server is: 13
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ ./a.out anything
14 OCT 2018 23:13:27 IST
The hostname is not found please enter a valid IPA.
(For localhost you can use 127.0.0.1 as an IPA)
The port number of the server is: 13
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$

```

Figure 6: using udp daytime client

### 7: question on making tcp daytime server iterative and changing question 6 tcp client side's port to 99XX

It has been coded and the code is in file question7cli.c (client part) and question7tcp.c (iterative tcp server part)

### Screenshot (How to compile and how output should appear)

```

Terminal
rahul@rahul-Vostro-3558: ~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ gcc question7cli.c
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ gcc question7cli.c -o client
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ ./client 127.0.0.1
Sun Oct 14 23:16:11 2018
The hostname is : localhost
The port number of the server is: 9928
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ ./client 127.0.0.1
Sun Oct 14 23:16:14 2018
The hostname is : localhost
The port number of the server is: 9928
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ ./client 127.0.0.1
Sun Oct 14 23:16:16 2018
The hostname is : localhost
The port number of the server is: 9928
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$

rahul@rahul-Vostro-3558: ~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ gcc question7servtcp.c
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ ./a.out
TCP (ITERATIVE) DAY TIME server started (listening...)
Received packet from 127.0.0.1
From port number: 51232
Received packet from 127.0.0.1
From port number: 51234
Received packet from 127.0.0.1
From port number: 51236
^C
rahul@rahul-Vostro-3558:~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$

```

Figure 7: using tcp daytime iterative server

tcpdump in wireshark

We saw captured the packages using tcpdump when these client and server side in question were communicating **Screenshot**

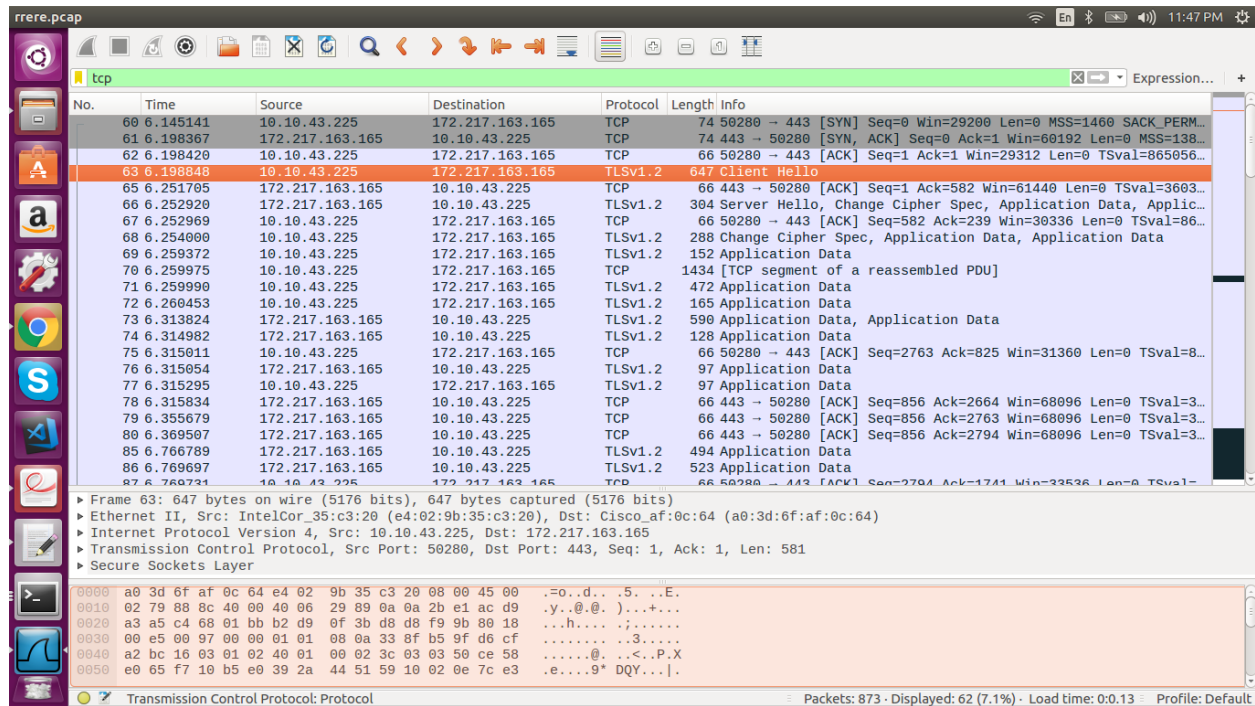


Figure 8: using tcpdump

## 8: question on making udp daytime server and changing question 6 udp client side's port to 99XX

It has been coded and the code is in file question8cli.c (client part) and question8udp.c (connectionless udp server part)

**Screenshot (How to compile and how output should appear)**

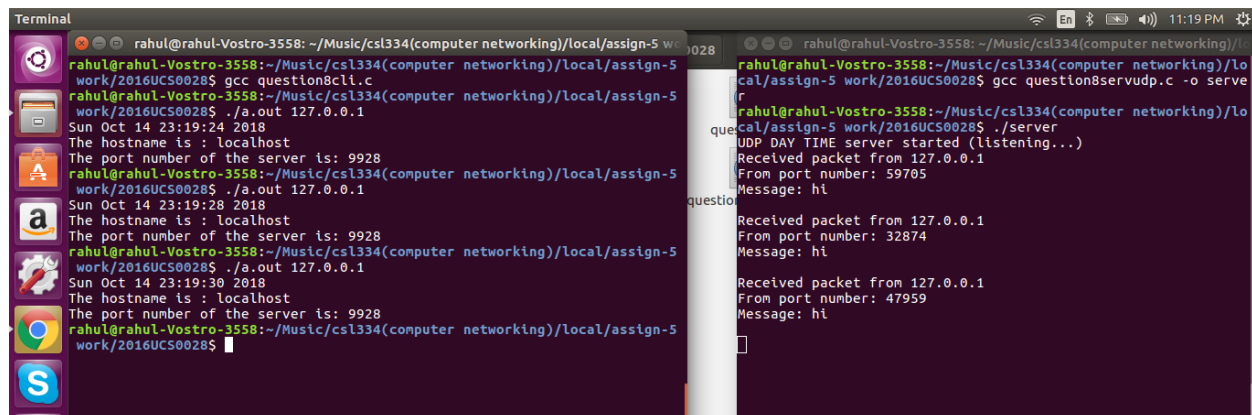


Figure 9: using udp daytime connectionless server

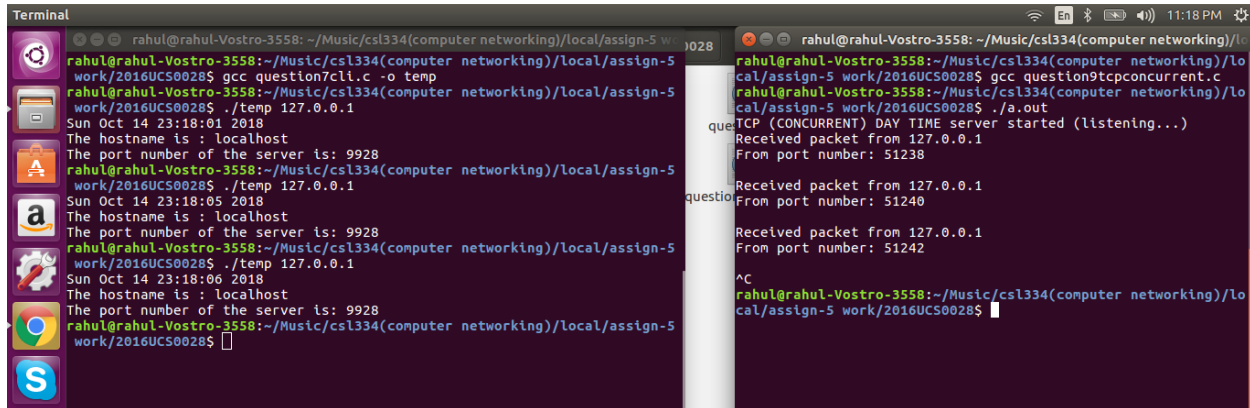
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**9: Modify the server program in problem 7 to make it work as a concurrent server**

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It has been coded and the code is in file question9tcpconcurrent.c (concurrent tcp day time server).

**Screenshot (How to compile and how output should appear)**



```
rahul@rahul-Vostro-3558: ~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ gcc question7cli.c -o temp
rahul@rahul-Vostro-3558: ~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ ./temp 127.0.0.1
Sun Oct 14 23:18:01 2018
The hostname is : localhost
The port number of the server is: 9928
rahul@rahul-Vostro-3558: ~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ ./temp 127.0.0.1
Sun Oct 14 23:18:05 2018
The hostname is : localhost
The port number of the server is: 9928
rahul@rahul-Vostro-3558: ~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ ./temp 127.0.0.1
Sun Oct 14 23:18:06 2018
The hostname is : localhost
The port number of the server is: 9928
rahul@rahul-Vostro-3558: ~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$
```

```
rahul@rahul-Vostro-3558: ~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ gcc question9tcpconcurrent.c
rahul@rahul-Vostro-3558: ~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$ ./a.out
TCP (CONCURRENT) DAY TIME server started (listening...)
Received packet from 127.0.0.1
From port number: 51238
Received packet from 127.0.0.1
From port number: 51240
Received packet from 127.0.0.1
From port number: 51242
AC
rahul@rahul-Vostro-3558: ~/Music/csl334(computer networking)/local/assign-5 work/2016UCS0028$
```

Figure 10: using tcp concurrent daytime server