Computer Networks - University Practical Examination

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GIVEN REQUIREMENTS:

There are two hosts, Client and Server. The Client requests the concurrent server for the date and time. The Server sends the date and time, which the Client accepts and prints.

TECHNICAL OBJECTIVE:

To implement a TCP/IP day time server (concurrent server) that handles multiple client requests. Once the client establishes connection with the server, the server sends its day-time details to the client which the client prints in its console.

METHODOLOGY: Server:

- ➢ ·Include the necessary header files.
- ➢ ·Create a socket using socket function with family AF_INET, type as SOCK_STREAM.
- ➢ ·Initialize server address to 0 using the bzero function.
- ➢ ·Assign the sin_family to AF_INET, sin_addr to INADDR_ANY, sin_port to statically
  assigned port number.
- ➢ ·Bind the local host address to socket using the bind function.
- ➢ ·Within a for loop, accept connection request from the client using accept function.
- ➢ ·Use the fork system call to spawn the processes.

- ➢ ·Calculate the current date and time using the ctime() function. Change the format so that it

Client:

is appropriate for human readable form and send the date and time to the client using the write function.

- ➢ ·Include the necessary header files.

- ➢ ·Create a socket using socket function with family AF_INET, type as SOCK_STREAM.

- ➢ ·Initialize server address to 0 using the bzero function.

- ➢ ·Assign the sin_family to AF_INET.

- ➢ ·Get the server IP address from the console.

- ➢ ·Using gethostbyname function assign it to a hostent structure, and assign it to sin_addr of
  the server address structure.

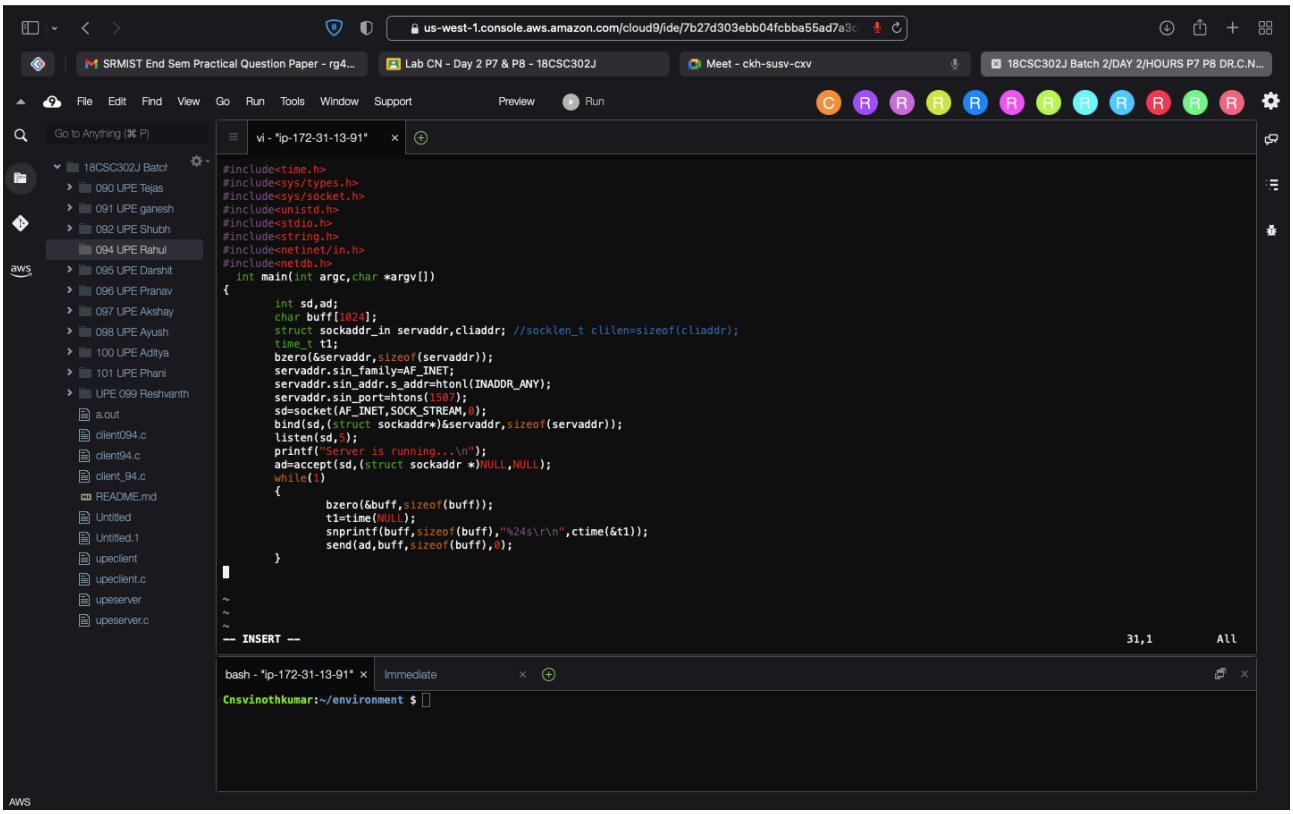
- ➢ ·Request a connection from the server using the connect function.

- ➢ ·Within an infinite loop, receive the date and time from the server using the read function
  and print the date and time on the console.

Server code:

```
#include<time.h>

 #include<sys/types.h>

#include<sys/socket.h>
```

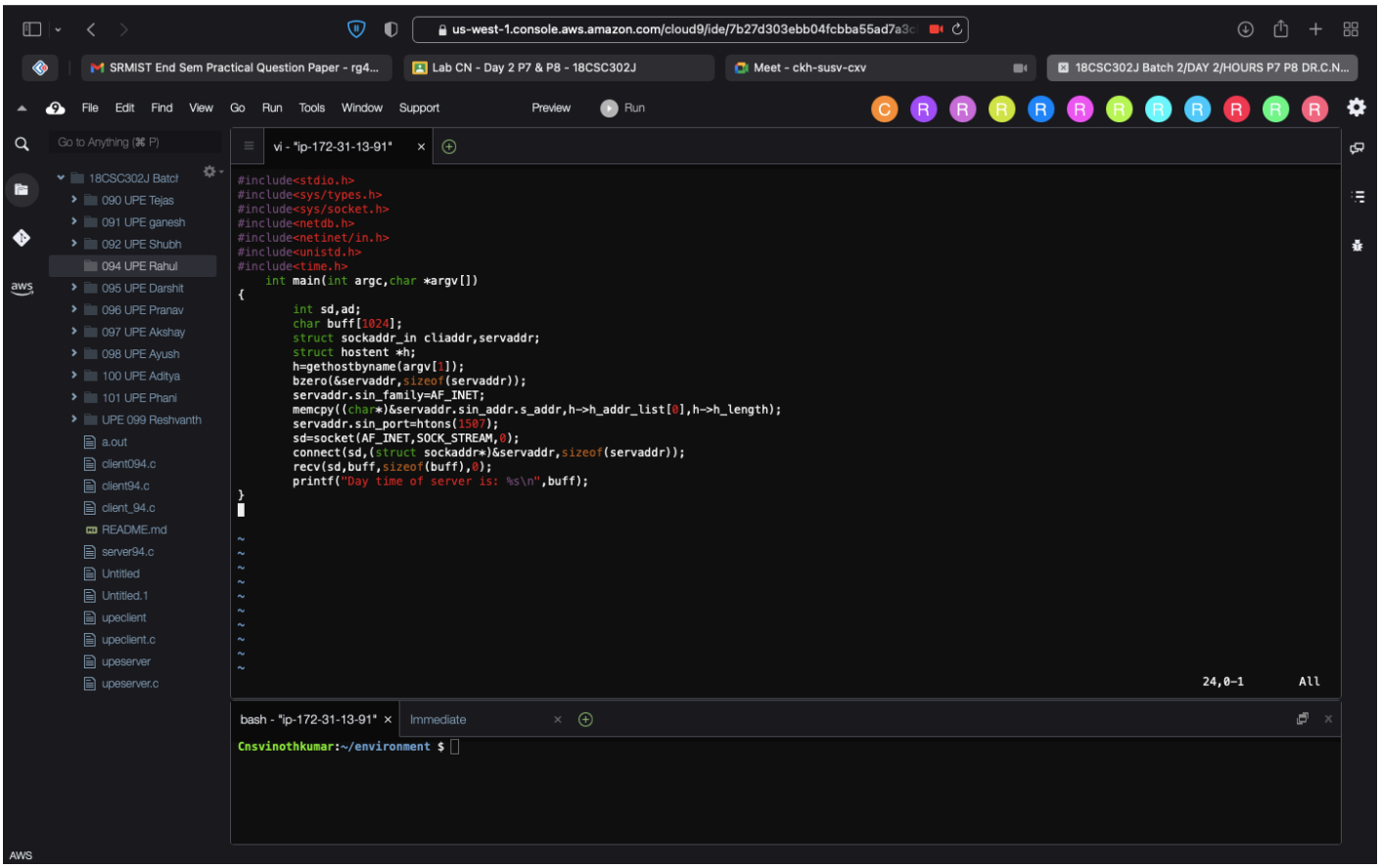
```
 #include<unistd.h>

#include<stdio.h>

 #include<string.h>

 #include<netinet/in.h>

#include<netdb.h>
int main(int argc,char *argv[]) {

int sd,ad;
char buff[1024];
struct sockaddr_in servaddr,cliaddr;

 //socklen_t clilen=sizeof(cliaddr); time_t t1;

bzero(&servaddr,sizeof(servaddr));

servaddr.sin_family=AF_INET;
servaddr.sin_addr.s_addr=htonl(INADDR_ANY);
servaddr.sin_port=htons(1507);

sd=socket(AF_INET,SOCK_STREAM,0);

listen(sd,5);
printf("Server is running...\n");
ad=accept(sd,(struct sockaddr *)NULL,NULL);

while(1)
{

bzero(&buff,sizeof(buff));

t1=time(NULL);


snprintf(buff,sizeof(buff),"%24s\r\n",ctime(&t1)); send(ad,buff,sizeof(buff),0);

}
```



CLIENT CODE:

```
#include<stdio.h>
 #include<sys/types.h>
 #include<sys/socket.h>
 #include<netdb.h>
#include<netinet/in.h>
 #include<unistd.h>
#include<time.h>
int main(int argc,char *argv[]) {
int sd,ad;
char buff[1024];
struct sockaddr_in cliaddr,servaddr;
 struct hostent *h;
h=gethostbyname(argv[1]);
```

```
bzero(&servaddr,sizeof(servaddr));


servaddr.sin_family=AF_INET; memcpy((char*)&servaddr.sin_addr.s_addr,h->h_addr_list[0],h->h_length);

 servaddr.sin_port=htons(1507);


sd=socket(AF_INET,SOCK_STREAM,0);

connect(sd,(struct sockaddr*)&servaddr,sizeof(servaddr));
recv(sd,buff,sizeof(buff),0);
printf("Day time of server is: %s\n",buff);

}
```



OUTPUT:

Server:

Cnsvinothkumar:~/environment $ vi server94.c

Cnsvinothkumar:~/environment $ cc server94.c

Cnsvinothkumar:~/environment $ ./a.out

Server is running...

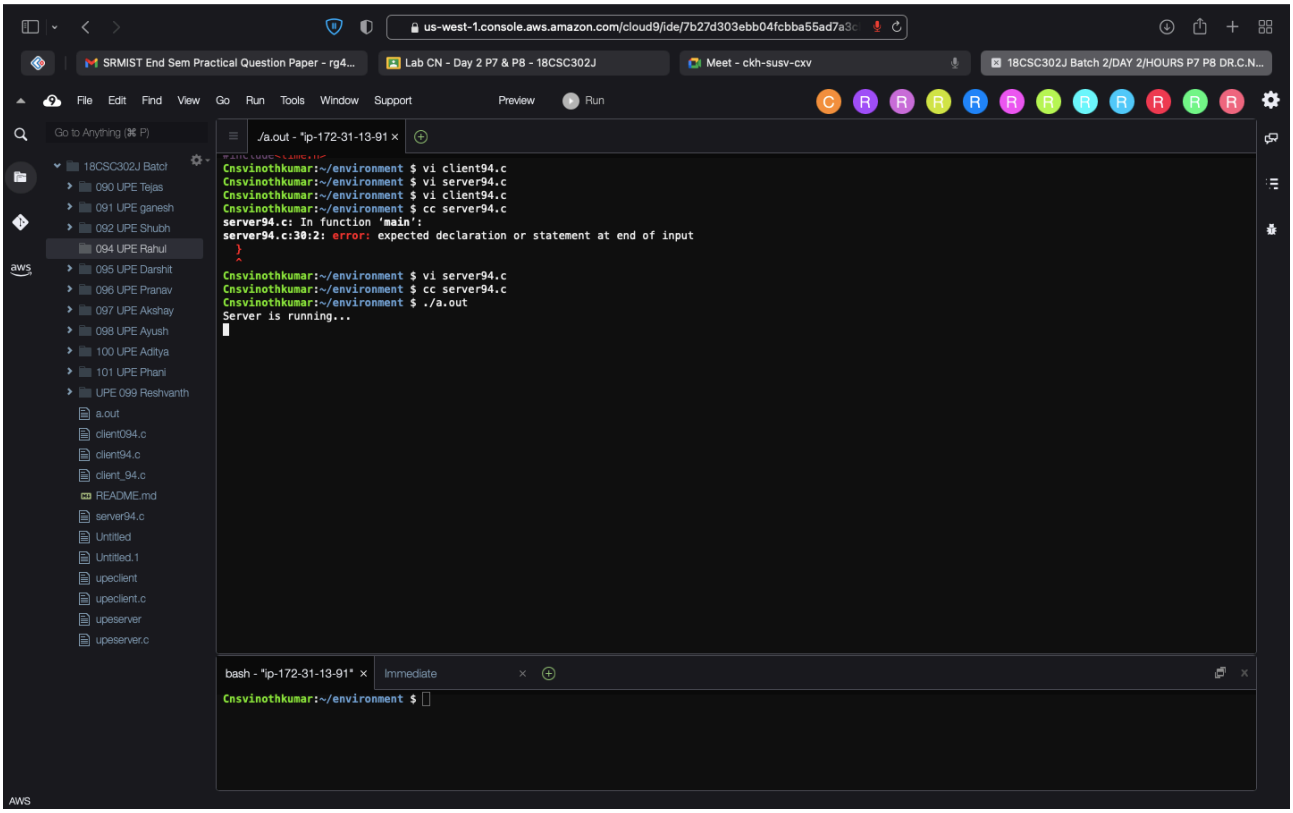
Client:

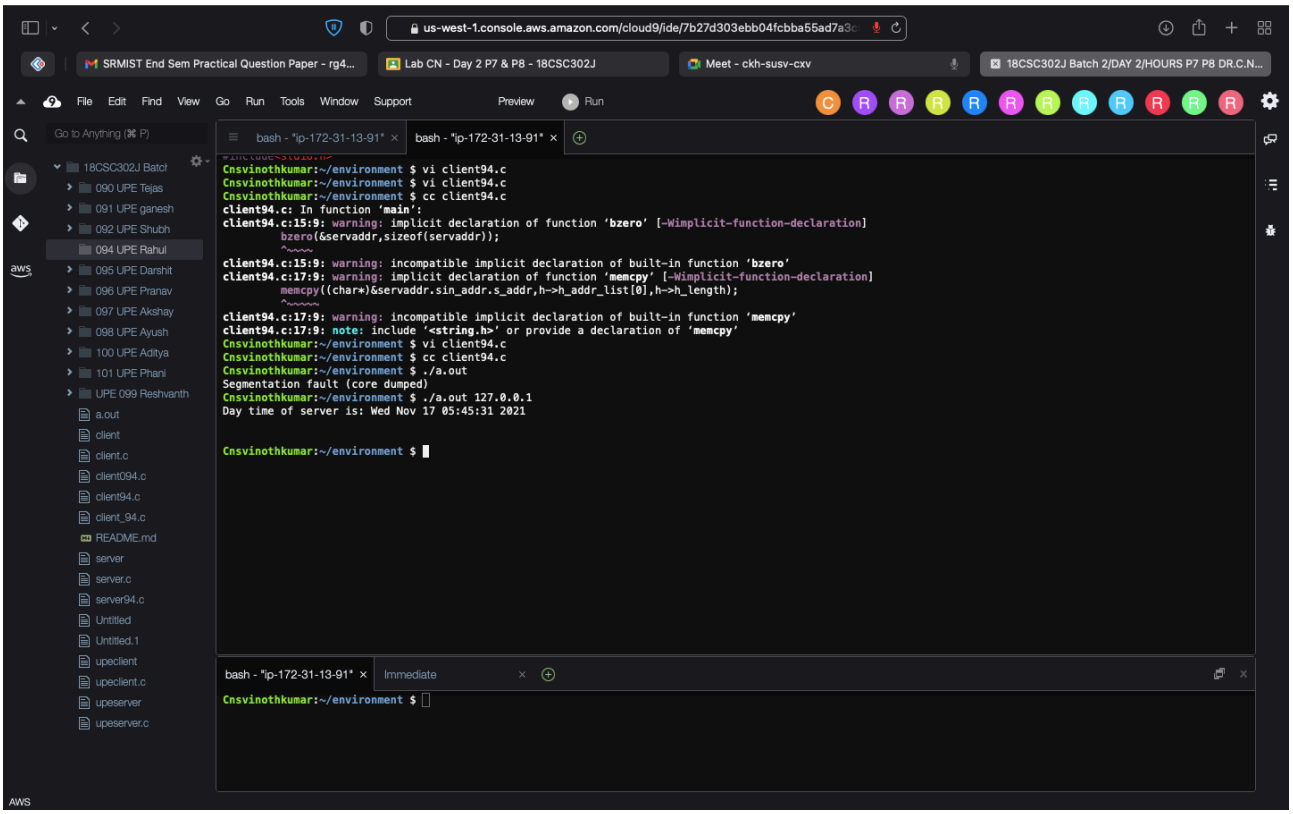
Cnsvinothkumar:~/environment $ vi dtclient.c

Cnsvinothkumar:~/environment $ cc dtclient.c

Cnsvinothkumar:~/environment $ ./a.out 127.0.0.1

Day time of server is : Wed Nov 17 05:45:31 2021





INFERENCE:

Thus the concurrent daytime client- server communication is established by sending the request message from the client to the concurrent server and the server sends its time to all the clients and displays it.