DCCN LAB ASSIGNMENT 02

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FA20-BCS-074

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Q1: CLIENT SERVER CHAT APPLICATION

CODE IN CLIENT.C

```
#include <arpa/inet.h> // inet_addr()

#include <netdb.h>

#include <stdio.h>

#include <stdlib.h>

#include <string.h>

#include <strings.h> // bzero()

#include <sys/socket.h>

#include <unistd.h> // read(), write(), close()

#define MAX 80

#define PORT 8080

#define SA struct sockaddr

void func(int sockfd)

{

    char buff[MAX];

    int n;

    for (;;) {

        bzero(buff, sizeof(buff));

        printf("Enter the string : ");

        n = 0;

        while ((buff[n++] = getchar()) != '\n')

            ;

        write(sockfd, buff, sizeof(buff));
        bzero(buff, sizeof(buff));
        read(sockfd, buff, sizeof(buff));
        printf("From Server : %s", buff);
        if ((strncmp(buff, "exit", 4)) == 0) {
            printf("Client Exit...\n");
            break;
        }
    }
}

int main()
{
    int sockfd, connfd;
    struct sockaddr_in servaddr, cli;

    // socket create and verification
    sockfd = socket(AF_INET, SOCK_STREAM, 0);
    if (sockfd == -1) {
        printf("socket creation failed...\n");
        exit(0);
    }
    else
        printf("Socket successfully created..\n");
    bzero(&servaddr, sizeof(servaddr));

    // assign IP, PORT
    servaddr.sin_family = AF_INET;
    servaddr.sin_addr.s_addr = inet_addr("127.0.0.1");
    servaddr.sin_port = htons(PORT);

    // connect the client socket to server socket
    if (connect(sockfd, (SA*)&servaddr, sizeof(servaddr))
        != 0) {
        printf("connection with the server failed...\n");
        exit(0);
    }
    else
        printf("connected to the server..\n");

    // function for chat
    func(sockfd);

    // close the socket
    close(sockfd);
}
```

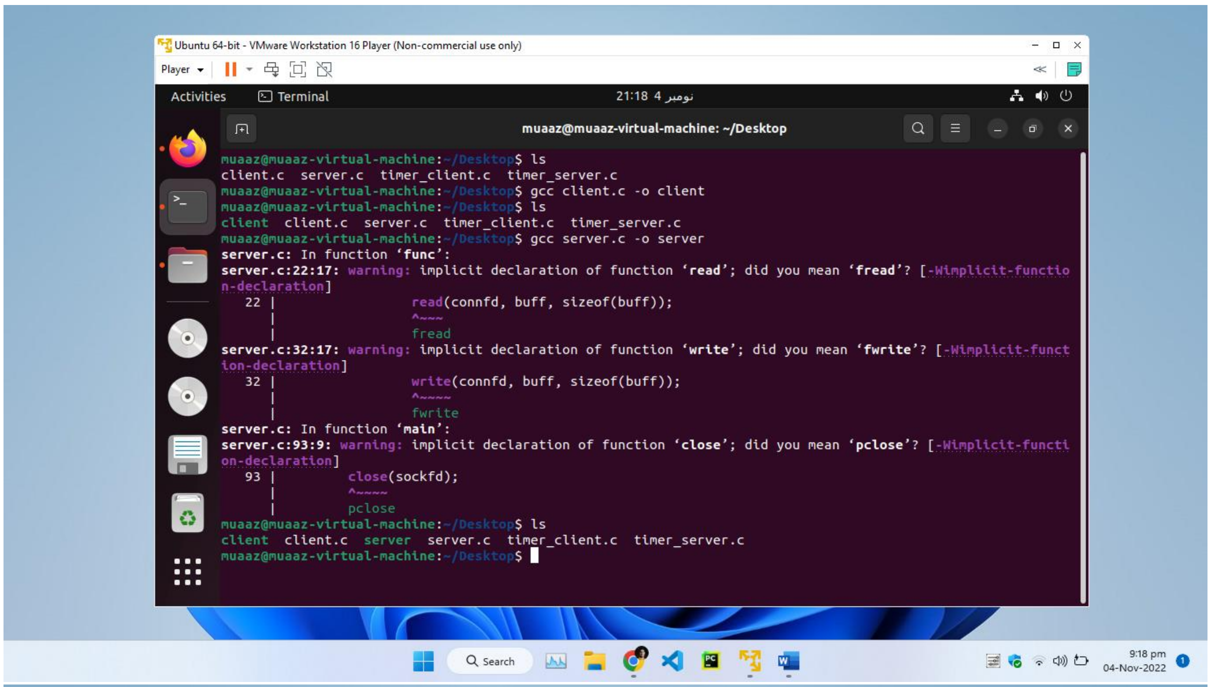
CODE IN SERVER.C

```
#include <stdio.h>
#include <netdb.h>
#include <netinet/in.h>
#include <stdlib.h>
#include <string.h>
#include <sys/socket.h>
#include <sys/types.h>
#define MAX 80
#define PORT 8080
#define SA struct sockaddr

// Function designed for chat between client and server.
void func(int connfd)
{
        char buff[MAX];
        int n;
```

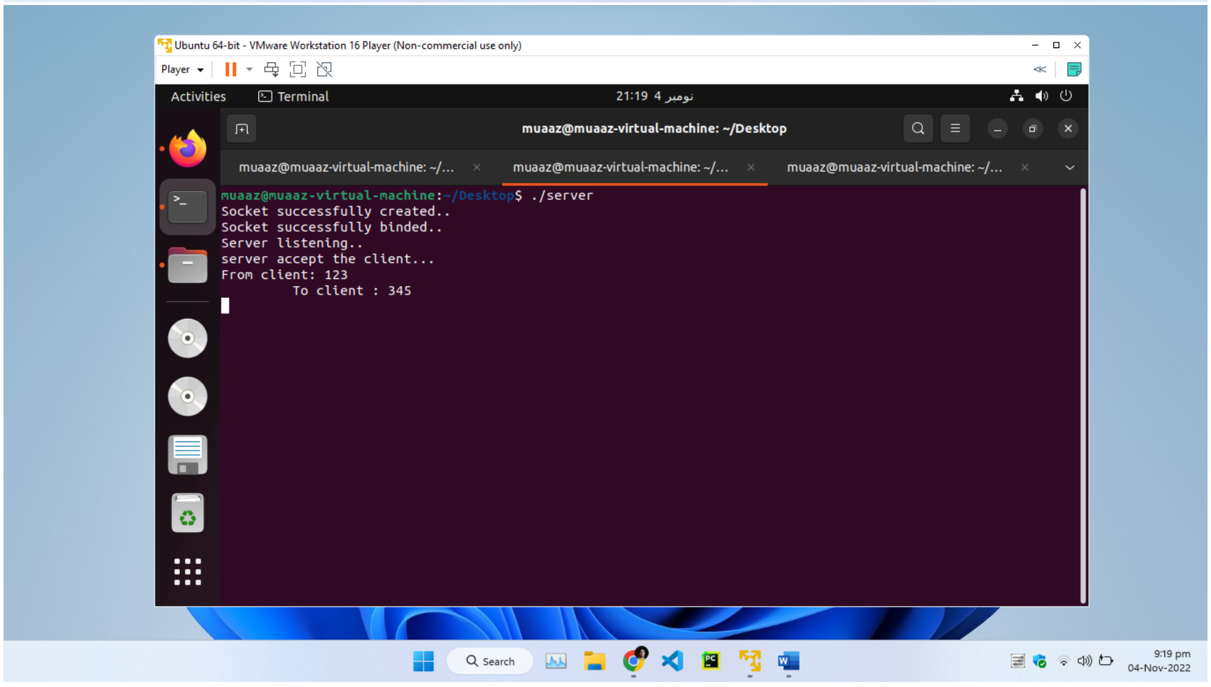
```
	// infinite loop for chat
	for (;;) {
		bzero(buff, MAX);

		// read the message from client and copy it in buffer
		read(connfd, buff, sizeof(buff));
		// print buffer which contains the client contents
		printf("From client: %s\t To client : ", buff);
		bzero(buff, MAX);
		n = 0;
		// copy server message in the buffer
		while ((buff[n++] = getchar()) != '\n')
			;

		// and send that buffer to client
		write(connfd, buff, sizeof(buff));

		// if msg contains "Exit" then server exit and chat ended.
		if (strncmp("exit", buff, 4) == 0) {
			printf("Server Exit...\n");
			break;
		}
	}
}

// Driver function
int main()
{
	int sockfd, connfd, len;
	struct sockaddr_in servaddr, cli;
```

```
// socket create and verification
sockfd = socket(AF_INET, SOCK_STREAM, 0);
if (sockfd == -1) {
        printf("socket creation failed...\n");
        exit(0);
}
else
        printf("Socket successfully created..\n");
bzero(&servaddr, sizeof(servaddr));

// assign IP, PORT
servaddr.sin_family = AF_INET;
servaddr.sin_addr.s_addr = htonl(INADDR_ANY);
servaddr.sin_port = htons(PORT);

// Binding newly created socket to given IP and verification
if ((bind(sockfd, (SA*)&servaddr, sizeof(servaddr))) != 0) {
        printf("socket bind failed...\n");
        exit(0);
}
else
        printf("Socket successfully binded..\n");

// Now server is ready to listen and verification
if ((listen(sockfd, 5)) != 0) {
        printf("Listen failed...\n");
        exit(0);
}
else
        printf("Server listening..\n");
len = sizeof(cli);
```

```
    // Accept the data packet from client and verification
    connfd = accept(sockfd, (SA*)&cli, &len);
    if (connfd < 0) {
        printf("server accept failed...\n");
        exit(0);
    }
    else
        printf("server accept the client...\n");

    // Function for chatting between client and server
    func(connfd);

    // After chatting close the socket
    close(sockfd);
}
```


Ubuntu 64-bit - VMware Workstation 16 Player (Non-commercial use only)
Player
Activities
Terminal
21:18 4 نوفمبر
muaaz@muaaz-virtual-machine: ~/Desktop
Search
9:18 pm
04-Nov-2022

```
muaaz@muaaz-virtual-machine:~/Desktop$ ls
client.c  server.c  timer_client.c  timer_server.c
muaaz@muaaz-virtual-machine:~/Desktop$ gcc client.c -o client
muaaz@muaaz-virtual-machine:~/Desktop$ ls
client  client.c  server.c  timer_client.c  timer_server.c
muaaz@muaaz-virtual-machine:~/Desktop$ gcc server.c -o server
server.c: In function ‘func’:
server.c:22:17: warning: implicit declaration of function ‘read’; did you mean ‘fread’? [-Wimplicit-functio
n-declaration]
   22 |                 read(connfd, buff, sizeof(buff));
      |                 ^~~~
      |                 fread
server.c:32:17: warning: implicit declaration of function ‘write’; did you mean ‘fwrite’? [-Wimplicit-funct
ion-declaration]
   32 |                 write(connfd, buff, sizeof(buff));
      |                 ^~~~~
      |                 fwrite
server.c: In function ‘main’:
server.c:93:9: warning: implicit declaration of function ‘close’; did you mean ‘pclose’? [-Wimplicit-functi
on-declaration]
   93 |         close(sockfd);
      |         ^~~~~
      |         pclose
muaaz@muaaz-virtual-machine:~/Desktop$ ls
client  client.c  server  server.c  timer_client.c  timer_server.c
muaaz@muaaz-virtual-machine:~/Desktop$ 
```


Ubuntu 64-bit - VMware Workstation 16 Player (Non-commercial use only)
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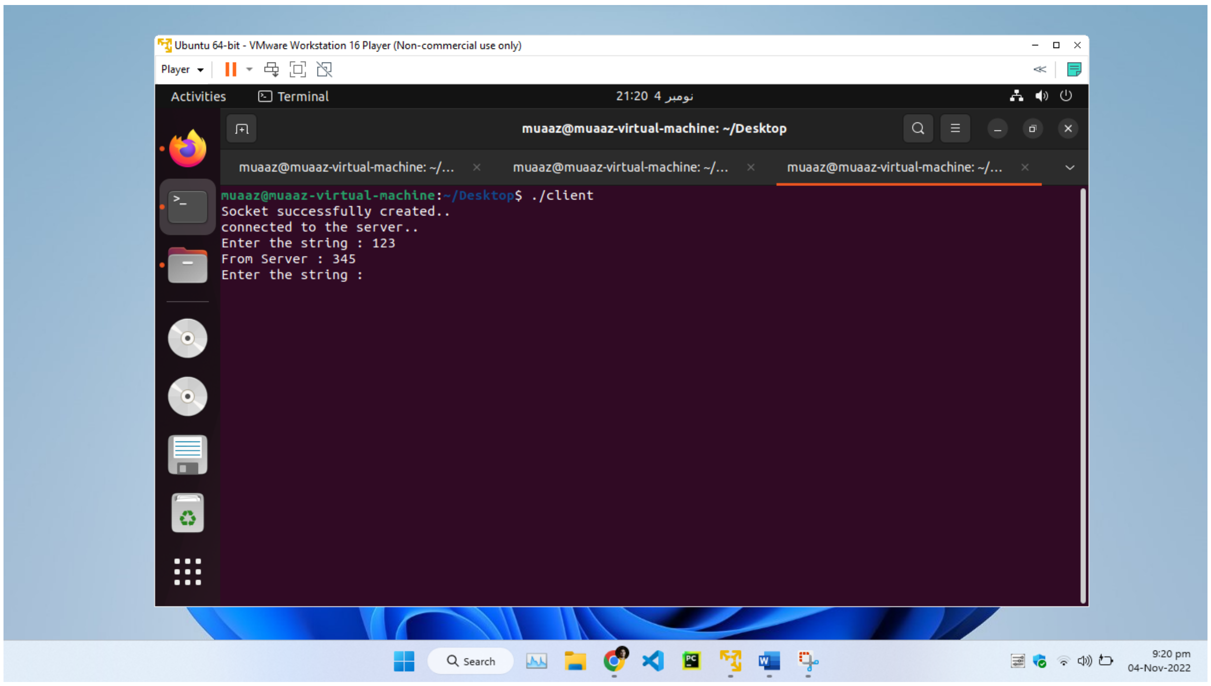
21:19 4 نوفمبر
muaaz@muaaz-virtual-machine: ~/Desktop
muaaz@muaaz-virtual-machine: ~/...
muaaz@muaaz-virtual-machine: ~/...
muaaz@muaaz-virtual-machine: ~/...
Search
9:19 pm
04-Nov-2022

```
muaaz@muaaz-virtual-machine:~/Desktop$ ./server
Socket successfully created..
Socket successfully binded..
Server listening..
server accept the client...
From client: 123
         To client : 345
```



```
muaaz@muaaz-virtual-machine:~/Desktop$ ./client
Socket successfully created..
connected to the server..
Enter the string : 123
From Server : 345
Enter the string :
```

Q2: TIME SERVER APPLICATION

CODE FOR CLIENT TIMER

```
#include<netinet/in.h>

#include<sys/socket.h>

main()

{

struct sockaddr_in sa,cli;

int n,sockfd;

int len;

char buff[100];

sockfd=socket(AF_INET,SOCK_STREAM,0);

if(sockfd<0)

{

printf("Error in Socket");

exit(0);

}

else

printf("Socket is Opened");

bzero(&sa,sizeof(sa));
sa.sin_family=AF_INET;

sa.sin_port=htons(5600);

if(connect(sockfd,(struct sockaddr*)&sa,sizeof(sa))<0)

{

printf("Error in connection failed");

exit(0);

}

else

printf("connected successfully"):

if(n=read(sockfd,buff,sizeof(buff))<0)

{

printf("Error in Reading");

exit(0);

}

else

{

printf("Message Read %s",buff);

buff[n]='\0';

printf("%s",buff);

}

}
```

CODE FOR SERVER TIMER

```
#include<netinet/in.h>

#include<sys/socket.h>

main( )

{

struct sockaddr_in sa;

struct sockaddr_in cli;

int sockfd,coontfd;

int len,ch;

char str[100];
time_t tick;
sockfd=socket(AF_INET,SOCK_STREAM,0);
if(socket<0)
{
printf(“error in socket\n”);
exit(0);
}
else
printf(“Socket Opened”);
bzero(7sa,sizeof(sa));
sa.sin_port=htons(5600);
sa.sin_addr.s_addr=htonl(0);
if(bind(sockfd,(struct sockaddr*)&sa,sizeof(sa))<0)
{
printf(“Error in binding\n”);
}
else
printf(“Binded Successfully”);
listen(sockfd,50)
for(;;)
{
len=sizeof(ch);
conntfd=accept(sockfd,(struct sockaddr*)&cli,&len);
printf(“Accepted”);
tick=ctime(NULL);
snprintf(str,sizeof(str),”%s”,ctime(&tick));
write(conntfd,str,100);
}
}
```