

EXPERIMENT 2

Objective 3

To implement the program where client reads a number x and sends to server. The server sends $2x$ and x^2 to the client. The client adds them and sends the result to the server. Server displays the result.

Code:

server.c

```
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
#include <string.h>
#include <sys/types.h>
#include <sys/socket.h>
#include <arpa/inet.h>
#include <netinet/in.h>

int main()
{
    int listenfd,connfd,len,n;
    char buff[200];

    struct sockaddr_in servaddr,cliaddr;
    len=sizeof(servaddr);
    servaddr.sin_family=AF_INET;

    servaddr.sin_addr.s_addr=htons( INADDR_ANY);

    servaddr.sin_port=htons(0);
    listenfd=socket(AF_INET,SOCK_STREAM,0);
    bind(listenfd, (struct sockaddr *)&servaddr,len);
    getsockname(listenfd,(struct sockaddr *)&servaddr ,&len);
    printf("Port for client=%ld\n",(long)ntohs(servaddr.sin_port));
    listen(listenfd,5);
    connfd=accept(listenfd,(struct sockaddr *)&cliaddr ,&len);

    // Read the number from client
    n=read(connfd , buff ,sizeof(buff));
    buff[n]=0;
    int num = atoi(buff);
    printf("\nReceived number from client= %d\n", num);

    // Store multiplied by 2 and squares in an string
    int numdata[2];
```

```

numdata[0] = num * 2;
numdata[1] = num * num;

strcpy(buff, "");
for(int i = 0; i < 2; i++)
{
    char temp[50];
    sprintf (temp, "%d", numdata[i]);
    strcat(buff, temp);
    strcat(buff, " ");
}

// Send the two numbers to client
write(connfd, buff ,sizeof(buff));

// Receive the sum and print in server
n=read(connfd , buff ,sizeof(buff));
buff[n]=0;

printf("\nReceived sum from client: %s\n", buff);

return 0;
}

```

client.c

```

#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
#include <string.h>
#include <sys/types.h>
#include <sys/socket.h>
#include <arpa/inet.h>
#include <netinet/in.h>

int main()
{
    int sockfd,len,n;
    long port;
    char buff[200];
    struct sockaddr_in cliaddr;
    len=sizeof(cliaddr);

    printf("Enter the port number you got from Server side:");
    scanf("%ld" ,&port);

    cliaddr.sin_family=AF_INET;
    cliaddr.sin_addr.s_addr=inet_addr("127.0.0.1");
    cliaddr.sin_port=htons(port);
    sockfd=socket(AF_INET,SOCK_STREAM,0);

```

```

connect(sockfd,(struct sockaddr *)&cliaddr,len);

// Input and send the number to server
printf("\nEnter a number: ");
scanf("%s", buff);
write(sockfd, buff ,sizeof(buff));

// Read values of multiplied by 2 and squares from server
n=read(sockfd,buff ,sizeof(buff));
buff[n]=0;
printf("\nReceived 2n and n^2 from server: %s\n", buff);

// Get the sum of received values
char* temp;
int sum = 0;
temp = strtok(buff, " ");
while( temp != NULL )
{
    sum += atoi(temp);
    temp = strtok(NULL, " ");
}

// Send the sum to the server
strcpy(buff, "");
sprintf (buff, "%d", sum);
write(sockfd, buff ,sizeof(buff));

return 0;
}

```

Output:

The image shows two terminal windows side-by-side. The left window is titled 'friday -' and shows the server's execution. The right window is also titled 'friday -' and shows the client's execution.

Server Window:

```

friday ~ | Desktop | sum of double and square server | server | la
server server.c
friday ~ | Desktop | sum of double and square server | server | gcc server.c -o serv
er
friday ~ | Desktop | sum of double and square server | server | ./server
Port for client=43259
Received number from client= 5
Received sum from client: 35
friday ~ | Desktop | sum of double and square server | server |

```

Client Window:

```

friday ~ | Desktop | sum of double and square server | client | la
client client.c
friday ~ | Desktop | sum of double and square server | client | gcc client.c -o clie
nt
friday ~ | Desktop | sum of double and square server | client | ./client
Enter the port number you got from Server side:43259
Enter a number: 5
Received 2n and n^2 from server: 10 25
friday ~ | Desktop | sum of double and square server | client |

```

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