CS359 Computer Networks - Assignment 9

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Question 1:

Introduction: The objective is to write TCP client-server C programs to send a string "Indian Institute of Technology Patna" from client to the server. The server will determine the number of vowels in the string and it will display them.

I have written two programs, **client1.c** and **server1.c**

Compilation: gcc client1.c –o client1   gcc server1.c –o server1

Execution: ./client1   ./server1

Sample Session:

Client Side	Server Side

```
┌[maheeth@maheeth-PC:~/D/W/C/lab9]─[05:25:55  IST]
└>$ gcc client1.c -o client1
┌[maheeth@maheeth-PC:~/D/W/C/lab9]─[05:25:59  IST]
└>$ ./client1
[+]Server socket created successfully.
[+]Connected to Server.

Client sent "Indian Institute of Technology Patna" to server

[+]Closing the connection.
```

```
┌[maheeth@maheeth-PC:~/D/W/C/lab9]─[05:25:55  IST]
└>$ gcc server1.c -o server1
┌[maheeth@maheeth-PC:~/D/W/C/lab9]─[05:26:07  IST]
└>$ ./server1
[+]Server socket created successfully.
[+]Binding successfull.
[+]Listening....

Received "Indian Institute of Technology Patna" from client
It has 13 vowel(s):
( I ) at position 0
( i ) at position 3
( a ) at position 4
( I ) at position 7
( i ) at position 11
( u ) at position 13
( e ) at position 15
( o ) at position 17
( e ) at position 21
( o ) at position 25
( o ) at position 27
( a ) at position 32
( a ) at position 35

[+]Closing the connection.
```

Question 2:

Introduction: The objective is to write TCP client-server C programs to send a string from client to server. On the server side, the string is displayed first and then checked whether it is a palindrome string.

I have written two programs, **client2.c** and **server2.c**

Compilation: gcc client2.c –o client2   gcc server2.c –o server2

Execution: ./client2   ./server2

Sample Session 1:

Client Side	Server Side

```
┌─[maheeth@maheeth-PC:~/D/W/C/lab9]─[05:34:33  IST]
└─>$ gcc client2.c -o client2
┌─[maheeth@maheeth-PC:~/D/W/C/lab9]─[05:34:43  IST]
└─>$ ./client2
Enter a string: Redivider
[+]Server socket created successfully.
[+]Connected to Server.

Client sent "Redivider" to server

[+]Closing the connection.
```

```
┌─[maheeth@maheeth-PC:~/D/W/C/lab9]─[05:34:35  IST]
└─>$ gcc server2.c -o server2
┌─[maheeth@maheeth-PC:~/D/W/C/lab9]─[05:34:54  IST]
└─>$ ./server2
[+]Server socket created successfully.
[+]Binding successfull.
[+]Listening....

Received "Redivider" from client
It is a palindrome string

[+]Closing the connection.
```

Sample Session 2:

Client Side	Server Side

```
┌─[maheeth@maheeth-PC:~/D/W/C/lab9]─[05:37:36  IST]
└─>$ gcc client2.c -o client2
┌─[maheeth@maheeth-PC:~/D/W/C/lab9]─[05:37:40  IST]
└─>$ ./client2
Enter a string: Palindrome
[+]Server socket created successfully.
[+]Connected to Server.

Client sent "Palindrome" to server

[+]Closing the connection.
```

```
┌─[maheeth@maheeth-PC:~/D/W/C/lab9]─[05:37:37  IST]
└─>$ gcc server2.c -o server2
┌─[maheeth@maheeth-PC:~/D/W/C/lab9]─[05:37:42  IST]
└─>$ ./server2
[+]Server socket created successfully.
[+]Binding successfull.
[+]Listening....

Received "Palindrome" from client
It is not a palindrome string

[+]Closing the connection.
```

Question 3:

Introduction: The objective is to write TCP client-server C programs to send an integer array from client to server. On the server side, the array is displayed and the sum of elements is determined. This sum is sent back to the client and displayed on the client side.

I have written two programs, **client3.c** and **server3.c**

Compilation: gcc client3.c –o client3 gcc server3.c –o server3

Execution: ./client3 ./server3

Sample Session 1:

Client Side	Server Side

```
┌─[maheeth@maheeth-PC:~/D/W/C/lab9]─[05:41:13  IST]
└─>$ gcc client3.c -o client3
┌─[maheeth@maheeth-PC:~/D/W/C/lab9]─[05:41:21  IST]
└─>$ ./client3
Enter number of integers: 5
Enter integers: 0 -3 5 7 -4

[+]Server socket created successfully.
[+]Connected to Server.

Client sent number of integers (5) to server
Client sent the array of integers to server

Received the sum of given integers as 5, from server

[+]Closing the connection.
```

```
┌─[maheeth@maheeth-PC:~/D/W/C/lab9]─[05:41:14  IST]
└─>$ gcc server3.c -o server3
┌─[maheeth@maheeth-PC:~/D/W/C/lab9]─[05:41:29  IST]
└─>$ ./server3
[+]Server socket created successfully.
[+]Binding successfull.
[+]Listening....

Received number of integers (5) from client
Received array of integers from client:
[0, -3, 5, 7, -4]

Sending sum of the integers (5) to client

[+]Closing the connection.
```

Sample Session 2:

Client Side	Server Side

```
┌─[maheeth@maheeth-PC:~/D/W/C/lab9]─[05:42:49  IST]
└─>$ gcc client3.c -o client3
┌─[maheeth@maheeth-PC:~/D/W/C/lab9]─[05:42:52  IST]
└─>$ ./client3
Enter number of integers: 7
Enter integers: 5 6 -9 0 1 10 2

[+]Server socket created successfully.
[+]Connected to Server.

Client sent number of integers (7) to server
Client sent the array of integers to server

Received the sum of given integers as 15, from server

[+]Closing the connection.
```

```
┌─[maheeth@maheeth-PC:~/D/W/C/lab9]─[05:42:50  IST]
└─>$ gcc server3.c -o server3
┌─[maheeth@maheeth-PC:~/D/W/C/lab9]─[05:42:51  IST]
└─>$ ./server3
[+]Server socket created successfully.
[+]Binding successfull.
[+]Listening....

Received number of integers (7) from client
Received array of integers from client:
[5, 6, -9, 0, 1, 10, 2]

Sending sum of the integers (15) to client

[+]Closing the connection.
```

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