Computer Networking Practice
COM302P
Assignment 2

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UDP program for calculator:

UDP Server:

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

double calculate(int choice, double num1, double num2)
{
   switch (choice){
   case 1:
      return(num1+num2);

   case 2:
      return(num1-num2);

   case 3:
      return(num1*num2);

   case 4:
      return(num1/num2);
   }
}


int main()
{
   int socket_calc;
   char buffer[1024] ="1)Add\n2)Subtract\n3)Multiply\n4)Divide\n5)Exit(pls enter 5 5 5)\nEnter
Operation\n num1\n num2\n";
         char tmp[100];
         socket_calc = socket(AF_INET , SOCK_DGRAM , 0);
```

```
        struct sockaddr_in serveraddr,clientaddr;

        if (socket_calc == -1)
        {
                printf("Could not create socket");
        }

        serveraddr.sin_family = AF_INET;
        serveraddr.sin_port = htons(8080);
        serveraddr.sin_addr.s_addr = inet_addr("0");

        bind(socket_calc, (const struct sockaddr *)&serveraddr,sizeof(serveraddr));

        int len = sizeof(clientaddr);

        struct input{
   int choice;
   double num1,num2;
   } Input;
        double Output;

        while(1)
        {
                recvfrom(socket_calc, (char *)tmp, 100, MSG_WAITALL, ( struct sockaddr *)
&clientaddr, &len);
                sendto(socket_calc,(const char*)buffer,sizeof(buffer),0,(const struct
sockaddr*)&clientaddr,len);
                recvfrom(socket_calc,(struct input*)&Input,sizeof(Input),0,NULL,NULL);
       if(Input.choice == 5)
          break;
       Output = calculate(Input.choice,Input.num1,Input.num2);
                sendto(socket_calc,(double*)&Output,sizeof(Output),0,(const struct
sockaddr*)&clientaddr,len);
        }
        close(socket_calc);
        return 0;
}
```

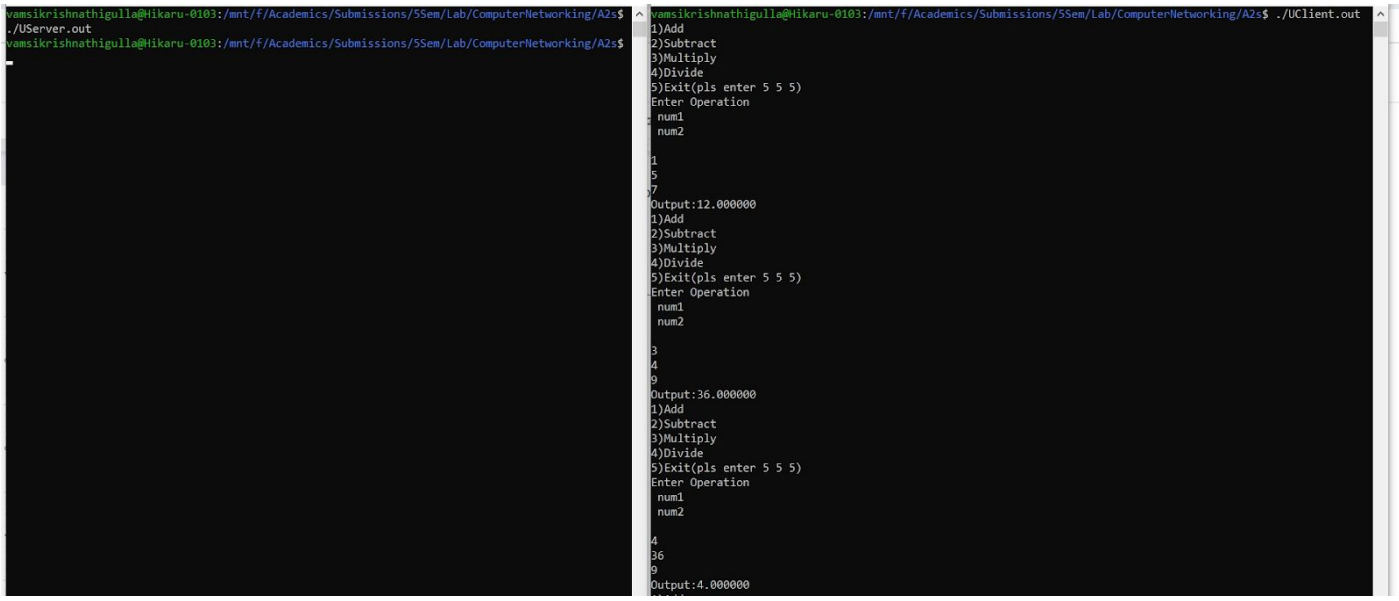
UDP Client:

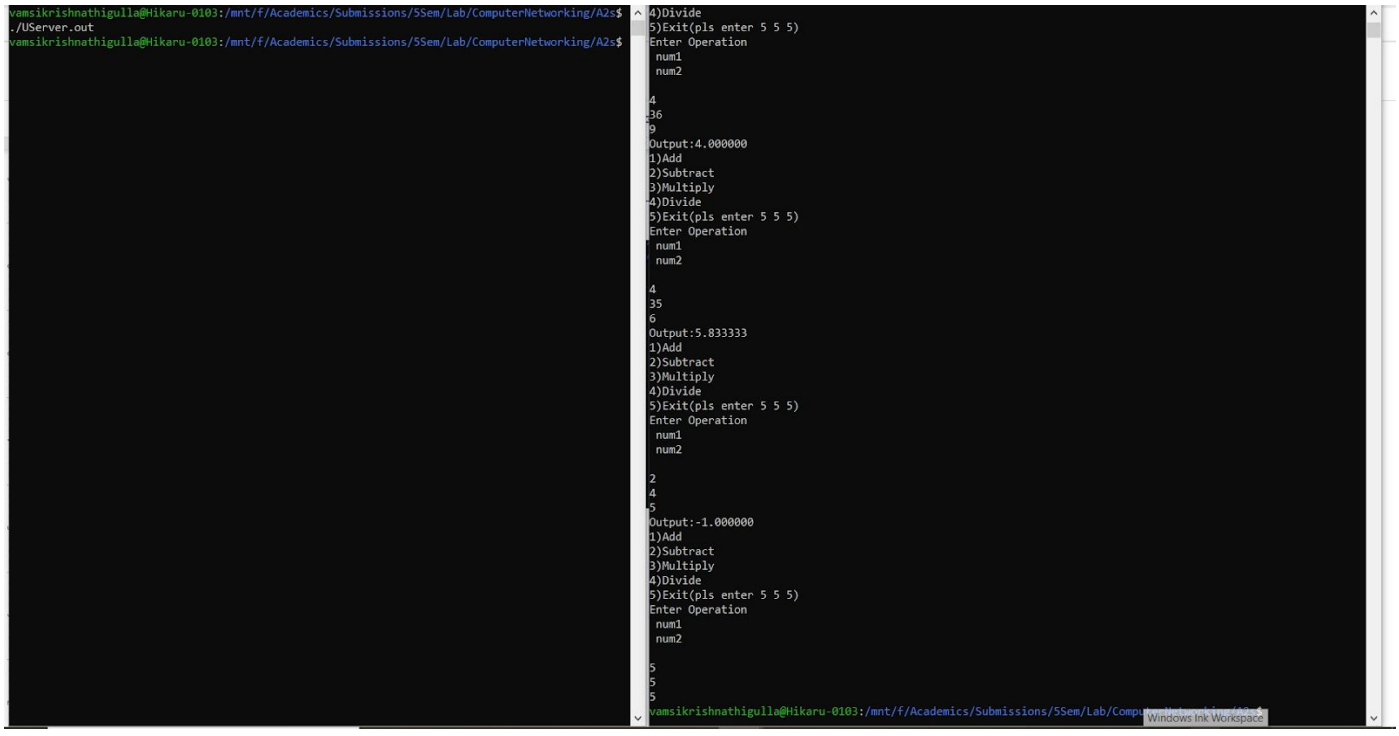
```
#include <unistd.h>
#include <stdio.h>
#include <sys/socket.h>
#include <stdlib.h>
```

```
#include <netinet/in.h>
#include <string.h>
#include <arpa/inet.h>

int main()
{
   int socket_calc,len;
   char buffer[1024]="hello server!";
        socket_calc = socket(AF_INET , SOCK_DGRAM , 0);
        struct sockaddr_in serveraddr;

        if (socket_calc == -1)
        {
                printf("Could not create socket");
        }

        serveraddr.sin_family = AF_INET;
        serveraddr.sin_port = htons(8080);
        serveraddr.sin_addr.s_addr = inet_addr("127.0.0.9");

        struct input{
   int choice;
   double num1,num2;
   } Input;
   double Output;

        while(1)
        {
                sendto(socket_calc,buffer,sizeof(buffer),0,(const struct
sockaddr*)&serveraddr,sizeof(serveraddr));
                recvfrom(socket_calc,buffer,sizeof(buffer),0,NULL,NULL);
      puts(buffer);
      scanf("%d%lf%lf",&Input.choice,&Input.num1,&Input.num2);
      if(Input.choice > 6)
      {
         printf("pls select from given options!\n");
         continue;
      }
                sendto(socket_calc,(struct Input*)&Input,sizeof(Input),0,(const struct
sockaddr*)&serveraddr,sizeof(serveraddr));
      if(Input.choice == 5)
         break;
```

```
                recvfrom(socket_calc,(struct input*)&Output,sizeof(Output),0,NULL,NULL);
    printf("Output:%lf\n",Output);
        }
        close(socket_calc);
        return 0;
}
```

Output:





TCP program for calculator:

TCP Server:

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

void die(char *message)
{
   printf("%s",message);
   exit(1);
}

double calculate(int choice, double num1, double num2)
{
   switch (choice){
   case 1:
      return(num1+num2);

   case 2:
      return(num1-num2);

   case 3:
      return(num1*num2);

   case 4:
      return(num1/num2);
   }
}

int main()
{
   int sd,conn_sd;
   char buffer[1024];

   sd = socket(AF_INET,SOCK_STREAM,0);
   if(sd==-1)
      die("Socket creation unsucessfull\n");
   struct sockaddr_in Server,Client;
```

```
   memset(&Server,0,sizeof(Server));

   Server.sin_family = AF_INET;
   Server.sin_port = htons(8080);
   Server.sin_addr.s_addr = inet_addr("0");

   if(bind(sd,(const struct sockaddr*)&Server,sizeof(Server)))
      die("Could not bind!\n");

   if(listen(sd,5))
      die("Too many connections!!!");

   socklen_t cli_len = sizeof(Client);
   conn_sd = accept(sd,(struct sockaddr*)&Client,&cli_len);

   if(conn_sd < 1)
      die("Error, can't accept connection!");

struct input{
   int choice;
   double num1,num2;
   } Input;
double Output;

   while(1)
   {
      read(conn_sd,&Input,sizeof(Input));
      if(Input.choice == 5)
         break;
      Output = calculate(Input.choice,Input.num1,Input.num2);
      write(conn_sd,&Output,sizeof(Output));
   }

   close(sd);
}
```

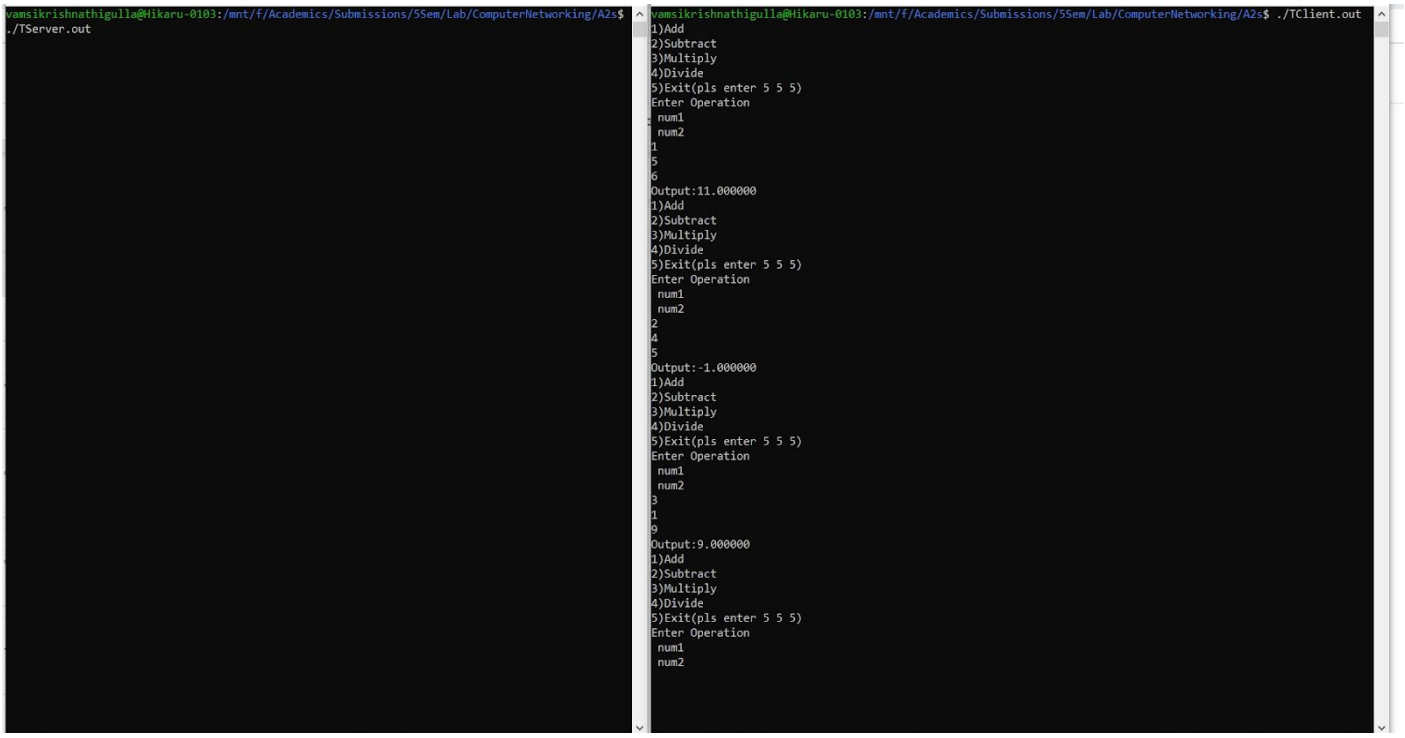
TCP Client:

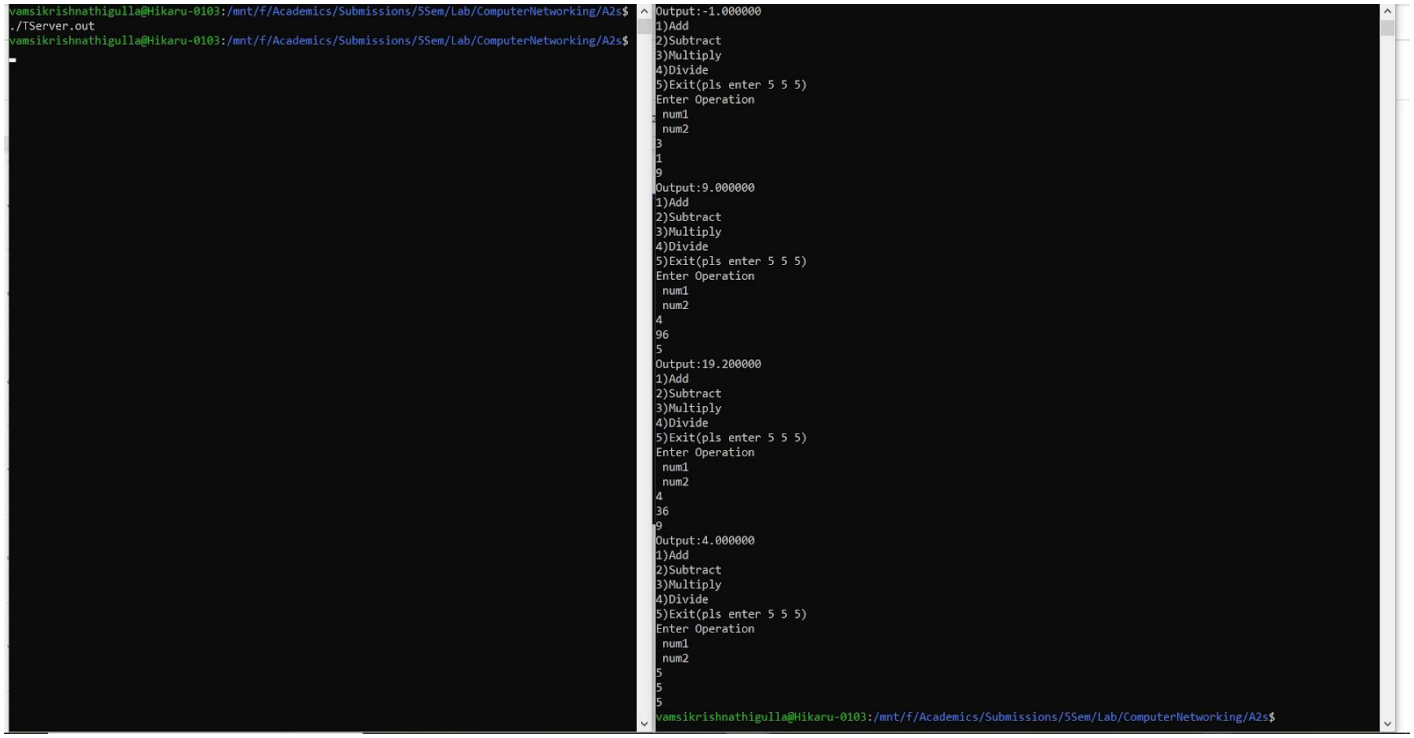
```
#include <unistd.h>
#include <stdio.h>
#include <sys/socket.h>
#include <stdlib.h>
#include <netinet/in.h>
#include <arpa/inet.h>
```

```
#include <string.h>

void die(char *message)
{
   printf("%s",message);
   exit(1);
}

int main()
{
   int sd;
   char buffer[1024] ="HELLO!\n";

   sd = socket(AF_INET,SOCK_STREAM,0);
   if(sd==-1)
      die("Error socket not opened!\n");

   struct sockaddr_in Server;
   Server.sin_family = AF_INET;
   Server.sin_port = htons(8080);
   Server.sin_addr.s_addr = inet_addr("0");

   if(connect(sd,(const struct sockaddr*)&Server,sizeof(Server)))
      die("Unable to connect to server!\n");

   struct input{
   int choice;
   double num1,num2;
   } Input;
   double Output;

   while(1)
   {
      printf("1)Add\n2)Subtract\n3)Multiply\n4)Divide\n5)Exit(pls enter 5 5 5)\nEnter Operation\n
num1\n num2\n");
      scanf("%d%lf%lf",&Input.choice,&Input.num1,&Input.num2);
      if(Input.choice > 6)
      {
         printf("pls select from given options!\n");
         continue;
      }
      write(sd,&Input,sizeof(Input));
```

```
    if(Input.choice == 5)
        break;

    read(sd,&Output,sizeof(Output));
    printf("Output:%lf\n",Output);
  }

  close(sd);
}
```

Output:




vamsikrishnathigulla@Hikaru-0103:/mnt/f/Academics/Submissions/5Sem/Lab/ComputerNetworking/A2s$
./TServer.out
vamsikrishnathigulla@Hikaru-0103:/mnt/f/Academics/Submissions/5Sem/Lab/ComputerNetworking/A2s$
Output:-1.000000
1)Add
2)Subtract
3)Multiply
4)Divide
5)Exit(pls enter 5 5 5)
Enter Operation
num1
num2
3
1
9
Output:9.000000
1)Add
2)Subtract
3)Multiply
4)Divide
5)Exit(pls enter 5 5 5)
Enter Operation
num1
num2
4
96
5
Output:19.200000
1)Add
2)Subtract
3)Multiply
4)Divide
5)Exit(pls enter 5 5 5)
Enter Operation
num1
num2
4
36
9
Output:4.000000
1)Add
2)Subtract
3)Multiply
4)Divide
5)Exit(pls enter 5 5 5)
Enter Operation
num1
num2
5
5
5
vamsikrishnathigulla@Hikaru-0103:/mnt/f/Academics/Submissions/5Sem/Lab/ComputerNetworking/A2s$