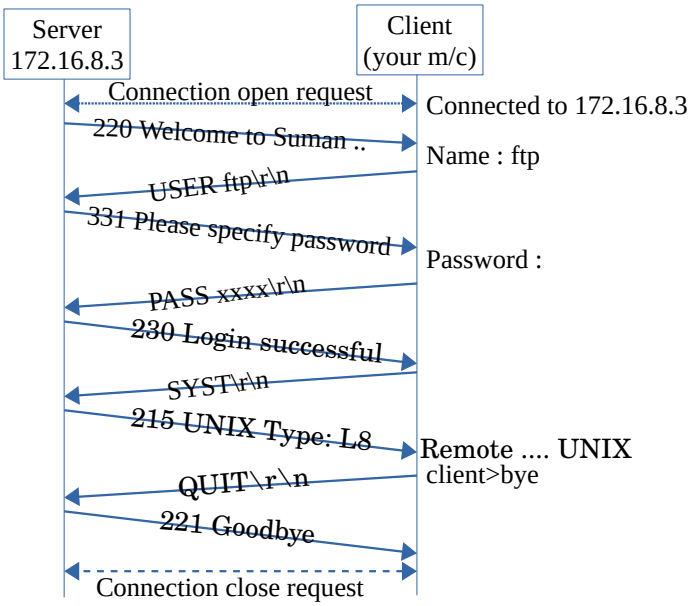
Problem : Write a C client program that will connect with a server running at port 21 and implement the following dialog.
Note : lines with three digit number are the string received from server. Lines with "--->" are the message sent by the client to the server. Text of green color are the text typed by user when asked by the client program. Other text with black color are the display given by the client itself.

$./MyClient 172.16.8.3
Connected to 172.16.8.3.
220 Welcome to Suman Bhowmik's FTP service.
Name : ftp
---> USER ftp\r\n
331 Please specify the password.
Password:
---> PASS XXXX\r\n
230 Login successful.
---> SYST\r\n
215 UNIX Type: L8
Remote system type is UNIX.
client> bye
---> QUIT\r\n
221 Goodbye.
$



---------- Snip ----------

```
/*****************************************************************************/
/*** File : my-ftp-client.c                                                ***/
/*** Author : Prof. (Dr.) Suman Bhowmik                                    ***/
/*****************************************************************************/


/*****************************************************************************
*   This is a port-read client.  It will accept any IP address and port
*   number on the commandline, connect to the server, send the message
*   (if any defined), read the reply, and close.
*****************************************************************************/
#include <stdarg.h>
#include <stdio.h>
#include <stdlib.h>
#include <errno.h>
#include <string.h>
#include <sys/socket.h>
#include <netinet/in.h>
#include <arpa/inet.h>
#include <resolv.h>
#include <netdb.h>
#include <errno.h>
#include <unistd.h>
```

```
#define MAXBUF    1024
#define FTP_PORT 21

int main(int Count, char *Strings[])
{
   int sockfd, bytes_read;
   struct sockaddr_in dest;// socket address
   struct hostent *he;//
   char buffer[MAXBUF];
   char str[100];

   /*---Make sure we have the right number of parameters---*/
   if ( Count != 2 )
   {
     fprintf(stderr, "usage: %s <server's hostname>\n", Strings[0]);
     exit(0);
   }

   /*--- Create socket for streaming ---*/
   if ( (sockfd = socket(AF_INET, SOCK_STREAM, 0)) < 0 )
   {
     perror("Socket");
     exit(errno);
   }
   printf("Socket created\n");
   if ((he=gethostbyname(Strings[1])) == NULL) {    /* get the host info */
           perror("gethostbyname");
           exit(1);
     }

   /*--- Initialize server address/port struct ---*/
   bzero(&dest, sizeof(dest));
   dest.sin_family = AF_INET;
   /*if ( inet_aton(Strings[1], &dest.sin_addr) == 0 )
   {
     perror(Strings[1]);
     exit(errno);
   }*/
   dest.sin_addr = *((struct in_addr *)he->h_addr);
   dest.sin_port = htons(FTP_PORT);
   //printf("---------------------- here\n");

   /*--- Connect to server---*/
   if ( connect(sockfd, (struct sockaddr *)&dest, sizeof(dest)) != 0 )
   {
```

```
  perror("Connect");
  exit(errno);
}
//printf("Connected to %s at port %d\n",inet_ntoa(dest.sin_addr), ntohs(dest.sin_port));

/*--- Receive and print the welcome message from server ---*/
bzero(buffer, MAXBUF);
recv(sockfd, buffer, MAXBUF, 0);
printf("%s\n",buffer);

/* Take user name from user and send it to server */
printf("Name :");
bzero(str, 100);
fgets(str, 100, stdin);
bzero(buffer, MAXBUF);
strncat(buffer, "USER ", 5);
strncat(buffer, str, strlen(str));
//printf("%s\n",buffer);
send(sockfd, buffer, strlen(buffer), 0);

/* receive and print the response from server */
bzero(buffer, MAXBUF);
recv(sockfd, buffer, MAXBUF, 0);
printf("%s\n",buffer);

/* Take password from user and send it to server */
printf("Password :");
bzero(str, 100);
fgets(str, 100, stdin);
bzero(buffer, MAXBUF);
strncat(buffer, "PASS ", 5);
strncat(buffer, str, strlen(str));
//printf("%s\n",buffer);
send(sockfd, buffer, strlen(buffer), 0);

/* receive and print the response from server */
bzero(buffer, MAXBUF);
recv(sockfd, buffer, MAXBUF, 0);
printf("%s\n",buffer);

bzero(buffer, MAXBUF);
strncat(buffer, "SYST\r\n", 6);
strncat(buffer, str, strlen(str));
//printf("%s\n",buffer);
send(sockfd, buffer, strlen(buffer), 0);
```

```
    bzero(buffer, MAXBUF);
    recv(sockfd, buffer, MAXBUF, 0);
    printf("%s\n",buffer);

    do{
      printf("client>");
      bzero(str, 100);
      fgets(str, 100, stdin);
      if(!strncmp(str, "quit", 4)){
       bzero(buffer, MAXBUF);
       strncat(buffer, "QUIT\r\n", 6);
       //printf("%s\n",buffer);
       send(sockfd, buffer, strlen(buffer), 0);

       //printf("receiving .....\n");
       bzero(buffer, MAXBUF);
       recv(sockfd, buffer, MAXBUF, 0);
       printf("%s\n",buffer);
       break;
      }else{
       printf("Invalid command try again!!\n");
       continue;
      }
    }while(1);

    /*---Clean up---*/
    close(sockfd);
    return 0;
}
```

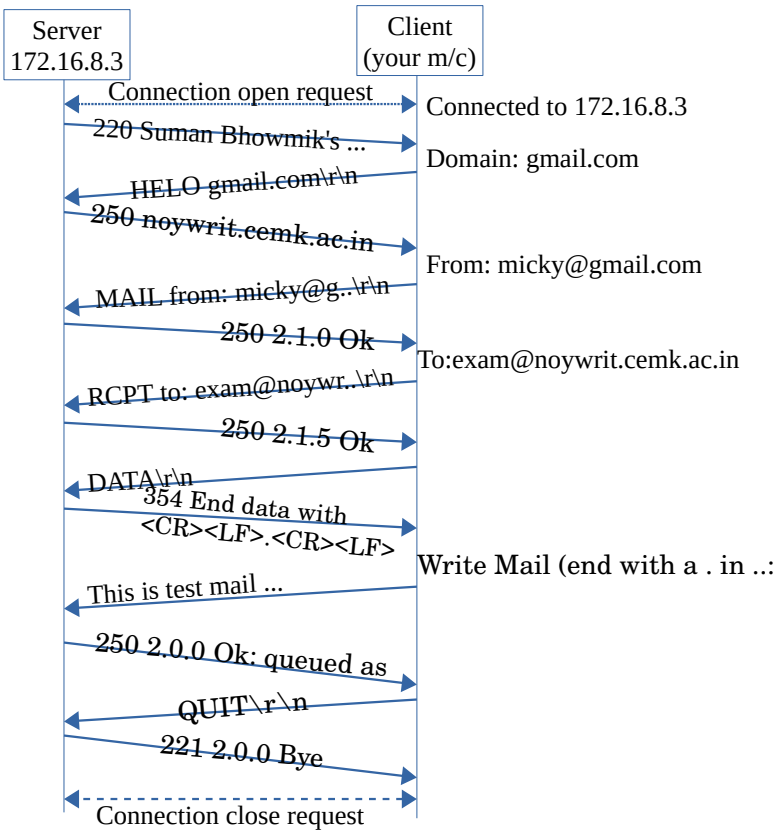
---------- Snip ----------

Do the following assignments:

Assignment 1: Write a C client program that will connect with a server running at port 25 and implement the following dialog.

Note : lines with three digit number is the string received from server. Lines with "--->" is the message sent by the client to the server. Text of green color are the text typed by user when asked by the client program. Other text with black color are the display given by the client itself.

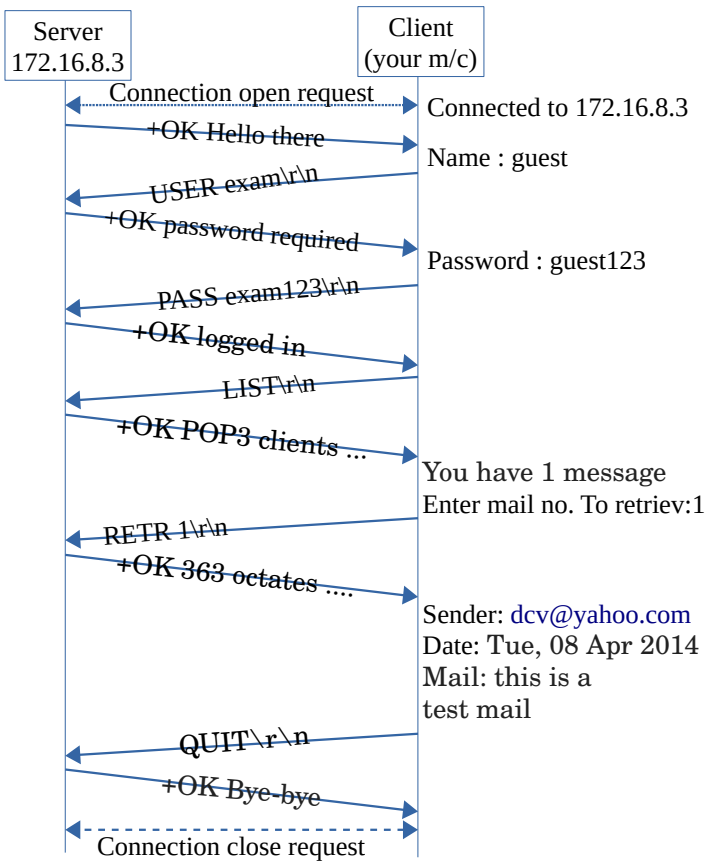
$./MyClient 172.16.8.3
Connected to 172.16.8.3.
220 Suman Bhowmik's ESMTP Postfix
Domain: gmail.com
--->HELO gmail.com\r\n
250 noywrit.cemk.ac.in
From: micky@gmail.com
--->MAIL from: micky@gmail.com\r\n
250 2.1.0 Ok
To: exam@noywrit.cemk.ac.in
--->RCPT to:exam@noywrit.cemk.ac.in\r\n
250 2.1.5 Ok
--->DATA\r\n
354 End data with <CR><LF>.<CR><LF>
Write Mail (end with a . in next line):
This is a test mail
from micky in gmail.com
.
--->This is a test mail
from micky in gmail.com
.
250 2.0.0 Ok: queued as 759C8358BCD
--->QUIT\r\n
221 2.0.0 Bye
$



Assignment2: Write a C client program that will connect with a server running at port 110 and implement the following dialog.
Note : lines with blue color are the string received from server. Lines with "--->" are the message sent by the client to the server. Text of green color are the text typed by user when asked by the client program. Other text with black color are the display given by the client itself.

$./PopClient 172.16.12.1
Connected to 172.16.12.1
+OK Hello there.
User: guest
--->USER guest\r\n
+OK Password required.
Password: guest123
--->PASS guest123\r\n
+OK logged in.
--->LIST
+OK POP3 clients that break here, they
violate STD53
1 363
.
You have 1 message
Enter mail no. To retrieve:1
--->RETR 1
+OK 363 octets follow.
Return-path: <dcv@yahoo.com>
Envelope-to: guest@csenetlab.cemk.ac.in
Delivery-date: Tue, 08 Apr 2014 10:04:54 +0530
Received: from w306-pc1.local ([172.16.12.1] helo=yahoo.com)
by w306-pc1 with smtp (Exim 4.80)
(envelope-from <dcv@yahoo.com>)
id 1WXNk6-0001cn-Ry
for guest@csenetlab.cemk.ac.in; Tue, 08 Apr 2014 10:04:51 +0530

this is a
test mail
.
Sender: dcv@yahoo.com
Date: Tue, 08 Apr 2014 ...
Mail: this is a
test mail
--->QUIT\r\n
+OK Bye-bye.
$



Assignment3: Write a C client program that will connect with a server running at port 143 and implement the following dialog.
Note : lines with blue color are the string received from server. Lines with "--->" are the message sent by the client to the server. Text of green color are the text typed by user when asked by the client program. Other text with black color are the display given by the client itself.

$./ImapClient 172.16.12.49
* OK [CAPABILITY ..... information.
User: guest
Password: guest123
--->a1 LOGIN guest guest123\r\n
* OK [ALERT] Filesystem ..... library)
a1 OK LOGIN Ok.
--->a2 LIST "" "*"\r\n
* LIST (\Unmarked ... "." "INBOX"
a2 OK LIST completed
--->a3 EXAMINE INBOX
* FLAGS (\Draft \Answered ... \Recent)
* OK [PERMANENTFLAGS ()] ...
permitted
* 1 EXISTS
* 1 RECENT
* OK [UIDVALIDITY 397209052] Ok
* OK [MYRIGHTS "acdilrsw"] ACL
a3 OK [READ-ONLY] Ok
You have 1 message
Enter mail no. To retrieve:1
--->a4 FETCH 1 BODY[]
* 1 FETCH (BODY[] {363}
Return-path: <dcv@yahoo.com>
Envelope-to: guest@csenetlab.cemk.ac.in
Delivery-date: Tue, 08 Apr 2014 10:04:54
+0530
Received: from w306-pc1.local
([172.16.12.1]
helo=yahoo.com)
by w306-pc1 with smtp (Exim 4.80)
(envelope-from <dcv@yahoo.com>)
id 1WXNk6-0001cn-Ry
for guest@csenet ... +0530

this is a
test mail
)
a4 OK FETCH completed.
--->a5 LOGOUT
* BYE Courier-IMAP server shutting down
a5 OK LOGOUT completed
Connection closed by foreign host.
$