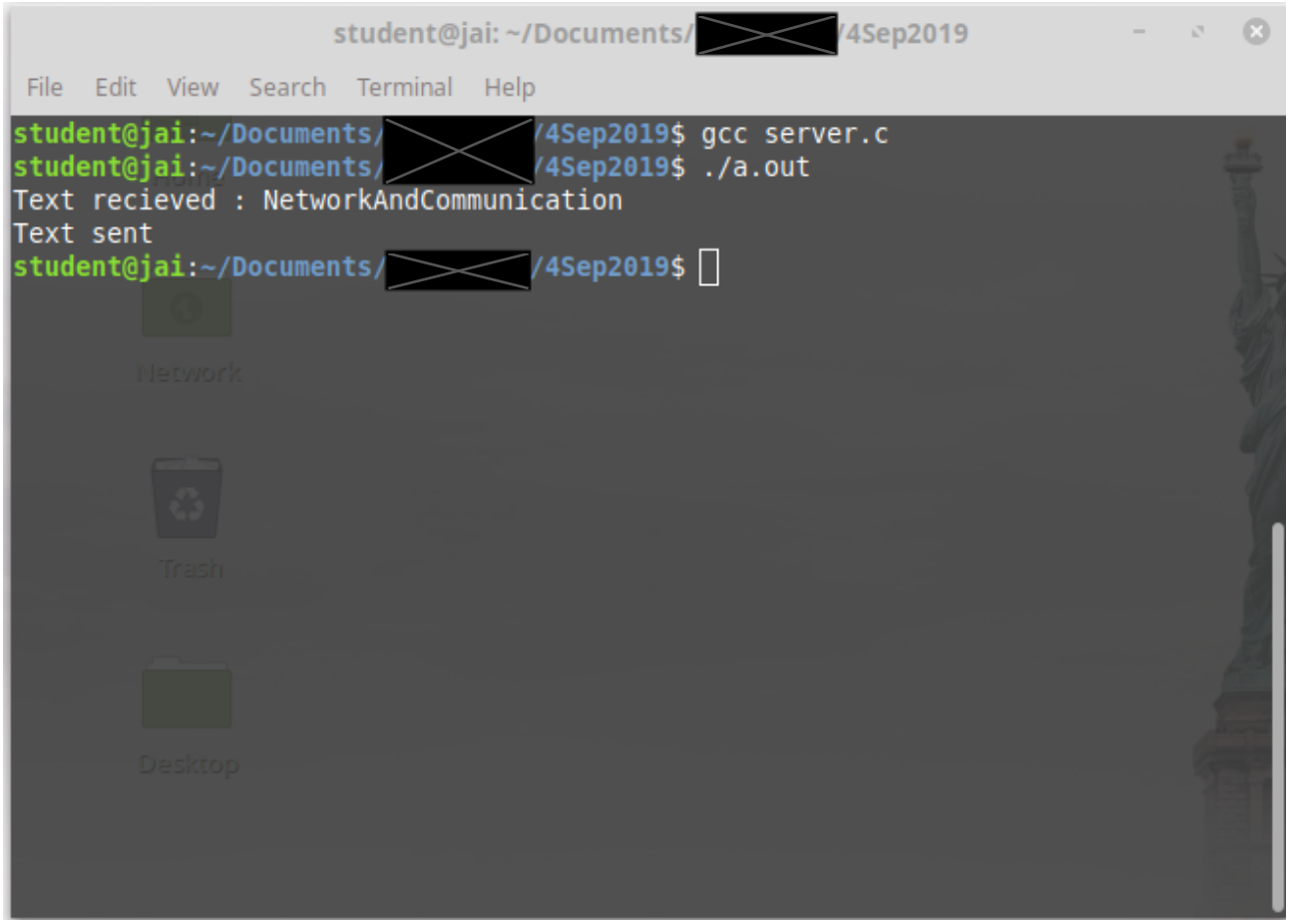
Echo Program :
Using TCP :

Server :

```
#include <unistd.h>
#include <stdio.h>
#include <sys/socket.h>
#include <stdlib.h>
#include <netinet/in.h>
#include <string.h>
#define PORT 8080
int main(int argc, char const *argv[])
{
    int server_fd, new_socket, valread;
    struct sockaddr_in address;
    int opt = 1;
    int addrlen = sizeof(address);

    // Creating socket file descriptor
    if ((server_fd = socket(AF_INET, SOCK_STREAM, 0)) == 0)
    {
        perror("socket failed");
        exit(EXIT_FAILURE);
    }

    // Forcefully attaching socket to the port 8080
    if (setsockopt(server_fd, SOL_SOCKET, SO_REUSEADDR | SO_REUSEPORT,
                                        &opt, sizeof(opt)))
    {
        perror("setsockopt");
        exit(EXIT_FAILURE);
    }
    address.sin_family = AF_INET;
    address.sin_addr.s_addr = INADDR_ANY;
    address.sin_port = htons( PORT );

    // Forcefully attaching socket to the port 8080
    if (bind(server_fd, (struct sockaddr *)&address,
                            sizeof(address))<0)
    {
        perror("bind failed");
        exit(EXIT_FAILURE);
    }
```

```
    if (listen(server_fd, 3) < 0)
    {
        perror("listen");
        exit(EXIT_FAILURE);
    }
    if ((new_socket = accept(server_fd, (struct sockaddr *)&address,
                    (socklen_t*)&addrlen))<0)
    {
        perror("accept");
        exit(EXIT_FAILURE);
    }

    char stri[1024];
    valread = read( new_socket , stri, sizeof(stri));
    printf("Text recieved : %s\n", stri);

    send(new_socket , stri , sizeof(stri), 0);
    printf("Text sent\n");
    return 0;
}
```



Client :

```
#include <stdio.h>
#include <sys/socket.h>
#include <arpa/inet.h>
#include <unistd.h>
#include <string.h>
#define PORT 8080

int main(int argc, char const *argv[])
{
    int sock = 0, valread;
    struct sockaddr_in serv_addr;
    if ((sock = socket(AF_INET, SOCK_STREAM, 0)) < 0)
    {
        printf("\n Socket creation error \n");
        return -1;
    }

    serv_addr.sin_family = AF_INET;
    serv_addr.sin_port = htons(PORT);

    // Convert IPv4 and IPv6 addresses from text to binary form
    if(inet_pton(AF_INET, "127.0.0.1", &serv_addr.sin_addr)<=0)
    {
        printf("\nInvalid address/ Address not supported \n");
        return -1;
    }

    if (connect(sock, (struct sockaddr *)&serv_addr, sizeof(serv_addr)) < 0)
    {
        printf("\nConnection Failed \n");
        return -1;
    }


    printf("Enter the text : ");
    char stri[1024];
    scanf("%s", stri);

    send(sock , stri , sizeof(stri), 0);
    printf("Text sent\n");

    char res[1024];
    valread = read( sock , res, sizeof(res));
    printf("The text recieved : %s\n", res);

    int i=0;
    if(strlen(stri)!=strlen(res))
    {
```

```
    printf("Echo Unuccessful!!\n");
  }
  else
  {
    int flag = 1;
    for(i=0;i<strlen(res);i++)
     {
       if(res[i]!=stri[i])
       {
         flag=0;
         break;
       }
     }
     if(flag)
     {
       printf("Echo Successful!!\n");
     }
     else
     {
       printf("Echo Unuccessful!!\n");
     }
  }
  return 0;
}
```