```c
//Interprocess communication.
/*
1.Develop an application for getting a name in parent and convert it into uppercase in child
using shared memory.
*/

//Program
#include<sys/ipc.h>
#define NULL 0
#include<sys/shm.h>
#include<sys/types.h>
#include<unistd.h>
#include<stdio.h>
#include<string.h>
#include<stdlib.h>
#include<sys/wait.h>
void strupr(char *a)
{
        for(int i = 0; a[i] != '\0'; i++)
                a[i] -= (a[i] >= 'a' && a[i] <= 'z') ? 32 : 0;
}
int main()
{
        int pid, id;
        char *a, *b;
        id = shmget(111, 50, IPC_CREAT | 00666);
        pid = fork();
        if(pid > 0)
        {
                a = shmat(id, NULL, 0);
                a[0] = '\0';
                printf("Enter a string: ");
                scanf("%s", a);
                wait(NULL);
                shmdt(a);
        }
        else
        {
                b = shmat(id, NULL, 0);
                while(b[0] == '\0');
                strupr(b);
                printf("Uppercase: %s\n", b);
                shmdt(b);
        }
        shmctl(id, IPC_RMID, NULL);
}
```

OUTPUT

2.Develop an client / server application for file transfer using shared memory.
*/
//Sever-Program

```c
#include <sys/ipc.h>
# define NULL 0
#include <sys/shm.h>
#include <sys/types.h>
# include<unistd.h>
# include<stdio.h>
# include<stdlib.h>
# include<string.h>
#include <sys/wait.h>
#include <stdio_ext.h>
int main()
{
  printf("SERVER-PROGRAM\n");
  int pid;
  char *a;
  int id,n,i;
  id=shmget(111,50,IPC_CREAT | 00666);
  a=shmat(id,NULL,0);
  printf("Enter the message: ");
  scanf("%s",a);
  shmdt(a);
  sleep(5);
}
```

//Client-program

```c
#include <sys/ipc.h>
#include <sys/shm.h>
#include <sys/types.h>
# include<unistd.h>
# include<stdio.h>
# include<stdlib.h>
# include<string.h>
#include <sys/wait.h>
#include <stdio_ext.h>
```

```c
int main()
{
 printf("CLIENT-PROGRAM\n");
 int pid;
 char *a;
 int id,n,i;
 id=shmget(111,50,00666);
 a=shmat(id,0,0);
 sleep(10);
 for(int i = 0; a[i] != '\0'; i++)
              a[i] -= (a[i] >= 'a' && a[i] <= 'z') ? 32 : 0;
 printf("The uppercase version the message received is : %s\n",a);
 shmdt(a);
 shmctl(id, IPC_RMID,NULL);
 sleep(4);
}
```

OUTPUT:

Server terminal:

```
praveen@praveen-Lenovo-ideapad-520-15IKB:~/Opearting systems/06. Interprocess Communication$ cd Q2
praveen@praveen-Lenovo-ideapad-520-15IKB:~/Opearting systems/06. Interprocess Communication/Q2$ gcc P2S.c -o s
praveen@praveen-Lenovo-ideapad-520-15IKB:~/Opearting systems/06. Interprocess Communication/Q2$ ./s
SERVER-PROGRAM
Enter the message: praveen
praveen@praveen-Lenovo-ideapad-520-15IKB:~/Opearting systems/06. Interprocess Communication/Q2$
```

Client terminal:

```
praveen@praveen-Lenovo-ideapad-520-15IKB:~/Opearting systems/06. Interprocess Communication$ cd Q2
praveen@praveen-Lenovo-ideapad-520-15IKB:~/Opearting systems/06. Interprocess Communication/Q2$ gcc P2C.c -o c
praveen@praveen-Lenovo-ideapad-520-15IKB:~/Opearting systems/06. Interprocess Communication/Q2$ ./c
CLIENT-PROGRAM
The uppercase version the message received is : PRAVEEN
praveen@praveen-Lenovo-ideapad-520-15IKB:~/Opearting systems/06. Interprocess Communication/Q2$
```

```
/*
3. Develop an client/server chat application using shared memory.
*/
//Person-1(initiator)
#include<sys/ipc.h>
#define NULL 0
#include<sys/shm.h>
#include<sys/types.h>
#include<unistd.h>
#include<stdio.h>
#include<string.h>
#include<stdlib.h>
#include<sys/wait.h>
int main()
{
  int id;
  char *a;
  char temp[50],t1[50];
  char s[50];
  strcpy(s,"*");
  id = shmget(115, 50, IPC_CREAT | 00666);
  a = shmat(id, NULL, 0);
  printf("You: ");
  scanf("%s",temp);
  strcat(s,temp);
  strcpy(a,s);
  strcpy(s,"*");
  while(1) {
    while(a[0]=='*');
    strcpy(t1,a);
     char *t = strtok(t1,"#");
    printf("Friend: %s\n",t);
    if(strcmp(t,"bye")==0)
      {
          strcpy(temp,"bye");
          printf("You: %s ",temp);
        sleep(5);
          break;
      }
    printf("You: ");
    scanf("%s",temp);
    strcat(s,temp);
    strcpy(a,s);
    strcpy(s,"*");
    if(strcmp(temp,"bye")==0)
      {
        sleep(5);
          break;
      }
  }
  printf("Connection Ended!\n");
```

```c
  shmdt(a);
}

//Person-2
#include<sys/ipc.h>
#define NULL 0
#include<sys/shm.h>
#include<sys/types.h>
#include<unistd.h>
#include<stdio.h>
#include<string.h>
#include<stdlib.h>
#include<sys/wait.h>
int main()
{
  int id;
  char *a;
  char temp[50],t1[50];
  char s[50];
  strcpy(s,"#");
  id = shmget(115, 50,00666);
  a = shmat(id, NULL, 0);
  strcpy(a,"#");
  while(1) {
   strcpy(s,"#");
   while(a[0]=='#');
    strcpy(t1,a);
    char *t = strtok(t1,"*");
    printf("Friend: %s\n",t);
    if(strcmp(t,"bye")==0)
     {
         strcpy(temp,"bye");
         printf("You: %s ",temp);
       sleep(11);
         break;
     }
   printf("You: ");
   scanf("%s",temp);
   strcat(s,temp);
   strcpy(a,s);
   strcpy(s,"#");
   if(strcmp(temp,"bye")==0)
     {
       sleep(5);
         break;
     }
  }
  printf("Connection Ended!\n");
  shmdt(a);
  shmctl(id, IPC_RMID, NULL);
}
```

OUTPUT

Terminal 1 (chat_person1 / p1):

```
praveen@praveen-Lenovo-ideapad-520-15IKB:~/Opearting systems/06. Interprocess Communication/Q
3$ gcc chat_person1.c -o p1
praveen@praveen-Lenovo-ideapad-520-15IKB:~/Opearting systems/06. Interprocess Communication/Q
3$ ./p1
Friend: hi
You: great
Friend: good
You: computer
Friend: science
You: fine
Friend: super
You: later
Friend: bye
You: bye Connection Ended!
praveen@praveen-Lenovo-ideapad-520-15IKB:~/Opearting systems/06. Interprocess Communication/Q
3$
```

Terminal 2 (chat_person2 / p2):

```
praveen@praveen-Lenovo-ideapad-520-15IKB:~/Opearting systems/06. Interprocess Communication/Q
3$ gcc chat_person2.c -o p2
praveen@praveen-Lenovo-ideapad-520-15IKB:~/Opearting systems/06. Interprocess Communication/Q
3$ ./p2
You: hi
Friend: great
You: good
Friend: computer
You: science
Friend: fine
You: super
Friend: later
You: bye
Connection Ended!
praveen@praveen-Lenovo-ideapad-520-15IKB:~/Opearting systems/06. Interprocess Communication/Q
3$
```