K191048
Amman Soomro

Task 1

```c
#include <stdio.h>
#include <sys/types.h>
#include <unistd.h>
#include <wait.h>
#include <stdlib.h>
int main(int argc, char *argv[])
{
   int fd[2];
   // fd[0] - read
   // fd[1] - write
   if (pipe(fd) == -1)
   {
       printf("An error occurred with opening the pipe\n");
       return 1;
   }
   int id = fork();
   if (id == 0)
   {
       close(fd[0]);
       int x;
       printf("Input a number: ");
       scanf("%d", &x);
       if (write(fd[1], &x, sizeof(int)) == -1)
       {
           printf("Error Occured While Writing");
           return 2;
       }
       sleep(1);
       printf("Input another number: ");
       scanf("%d", &x);
       if (write(fd[1], &x, sizeof(int)) == -1)
       {
           printf("Error Occured While Writing");
           return 2;
       }
       sleep(1);
       printf("Input another number: ");
       scanf("%d", &x);
       if (write(fd[1], &x, sizeof(int)) == -1)
       {
```

```
            printf("Error Occured While Writing");
            return 2;
        }
        close(fd[1]);
    }
    else
    {

        close(fd[1]);
        int y;
        if (read(fd[0], &y, sizeof(int)) == -1)
        {

            printf("Error Occured While reading");
            return 2;
        }
        printf("GOT FROM CHILD PROCESS %d \n", y);
        if (read(fd[0], &y, sizeof(int)) == -1)
        {

            printf("Error Occured While reading");
            return 2;
        }
        printf("GOT FROM CHILD PROCESS %d \n", y);
        if (read(fd[0], &y, sizeof(int)) == -1)
        {

            printf("Error Occured While reading");
            return 2;
        }
        printf("GOT FROM CHILD PROCESS %d \n", y);
        close(fd[0]);

    }
    return 0;
}
```

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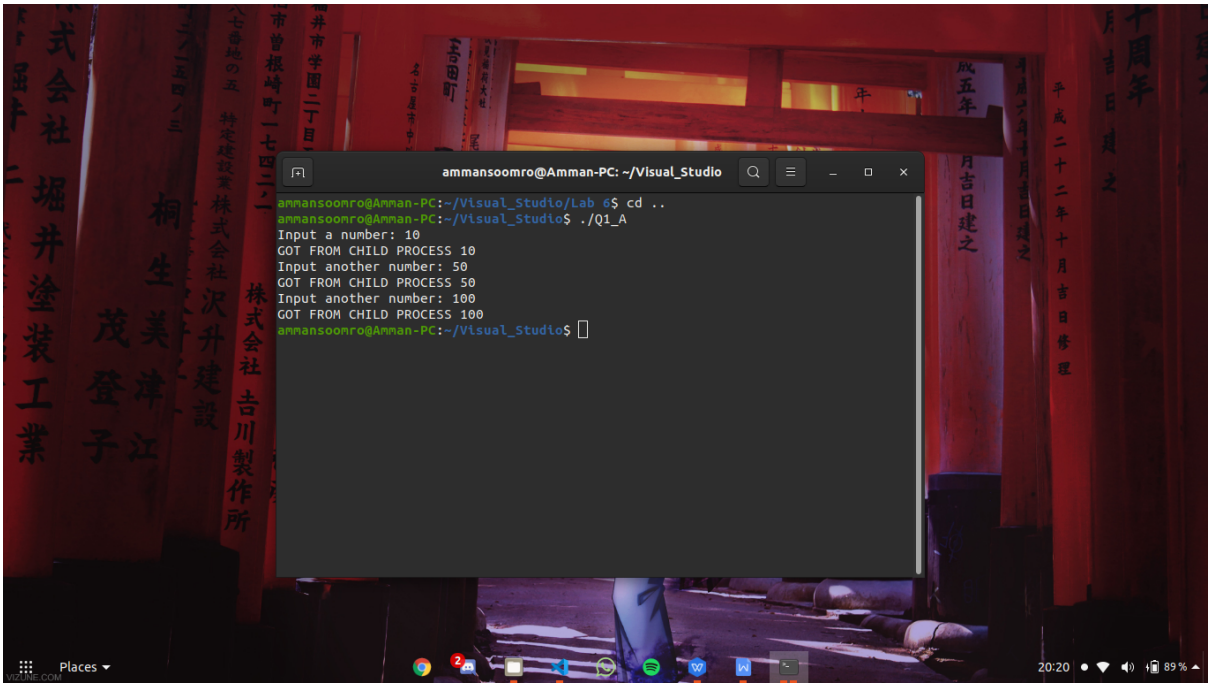

Task 2

Read

```c
#include<stdio.h>
#include<sys/stat.h>
#include<sys/types.h>
#include<fcntl.h>
#include<unistd.h>
#include<string.h>
int main(void) {
   int fd, retval;
   char buffer[20];
   fd = open("/tmp/ammansoomro",O_RDONLY);
   while(1){
        fflush(stdin);
        memset(buffer, 0, sizeof(buffer));
        read(fd, buffer, sizeof(buffer));
        if(buffer[0]=='0')
        {
            break;
        }
        printf("Message from HeadQuarter: ");
        puts(buffer);
   }
   close(fd);
```

```
    return 0;
}
```

Write

```
#include<stdio.h>
#include<sys/stat.h>
#include<sys/types.h>
#include<fcntl.h>
#include<unistd.h>
#include<string.h>
int main(void) {
    int fd, retval;
    char buffer[20];
    retval = mkfifo("/tmp/ammansoomro",0777);
    fd = open("/tmp/ammansoomro",O_WRONLY);
    while(1){
        fflush(stdin);
        memset(buffer, 0, sizeof(buffer));
        printf("******Enter your secret message for your sleeper
Agents*****\n");
        gets(buffer);
        write(fd,buffer,sizeof(buffer));
        if(buffer[0]=='0')
        {
            break;
        }
    }
    close(fd);
    return 0;
}
```

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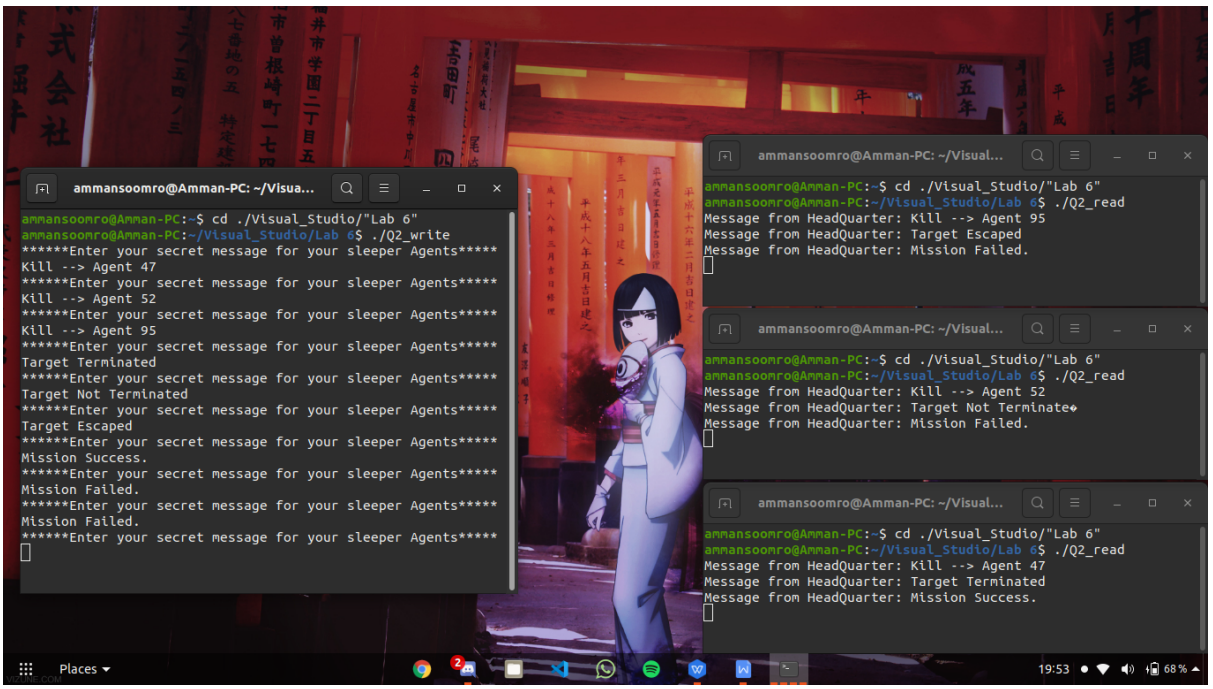

Task 3

File A

```c
#include<sys/types.h>
#include<sys/ipc.h>
#include<sys/shm.h>
#include<stdio.h>
#include<stdlib.h>
#include<string.h>
void main(){
   int num;
   key_t key = ftok("key_file",10);
   int shmid = shmget(key,1024,0666|IPC_CREAT);
   int *str =  shmat(shmid,(void*)0,0);
   printf("Enter the number(1-10):");
   scanf("%d",&num);
   *str=num;
   printf("Data written in memory: %d\n",*str);
   while(*str==num);
   while(1){
       sleep(1);
       if(*str=='r'){
           printf("Data written in memory: %c\n",(char)*str);
           *str='*';}
```

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```
        else if(*str=='b')
            break;
        else if(*str!='*'){
            printf("%d",*str);
            printf("\n");
            *str='*';
        }
    }
    shmdt(str);
    shmctl(shmid,IPC_RMID,NULL);
    return;
}
```

File B

```
#include<sys/types.h>
#include<sys/ipc.h>
#include<sys/shm.h>
#include<stdio.h>
#include<stdlib.h>
#include<string.h>
void main()
{
    int num,i,res;
    key_t key = ftok("key_file",10);
    int shmid = shmget(key,1024,0666|IPC_CREAT);
    int *str = shmat(shmid,(void*)0,0);
    printf("Data read from memory: %d\n",*str);
    num=*str;
    *str='r';
    i=1;
    while(1){
        sleep(1);
        if(*str=='*'){
            *str=num*i;
            i++;
        }
        if(i>11){
            *str='b';
            break;
        }
    }
    shmdt(str);
    shmctl(shmid,IPC_RMID,NULL);
```

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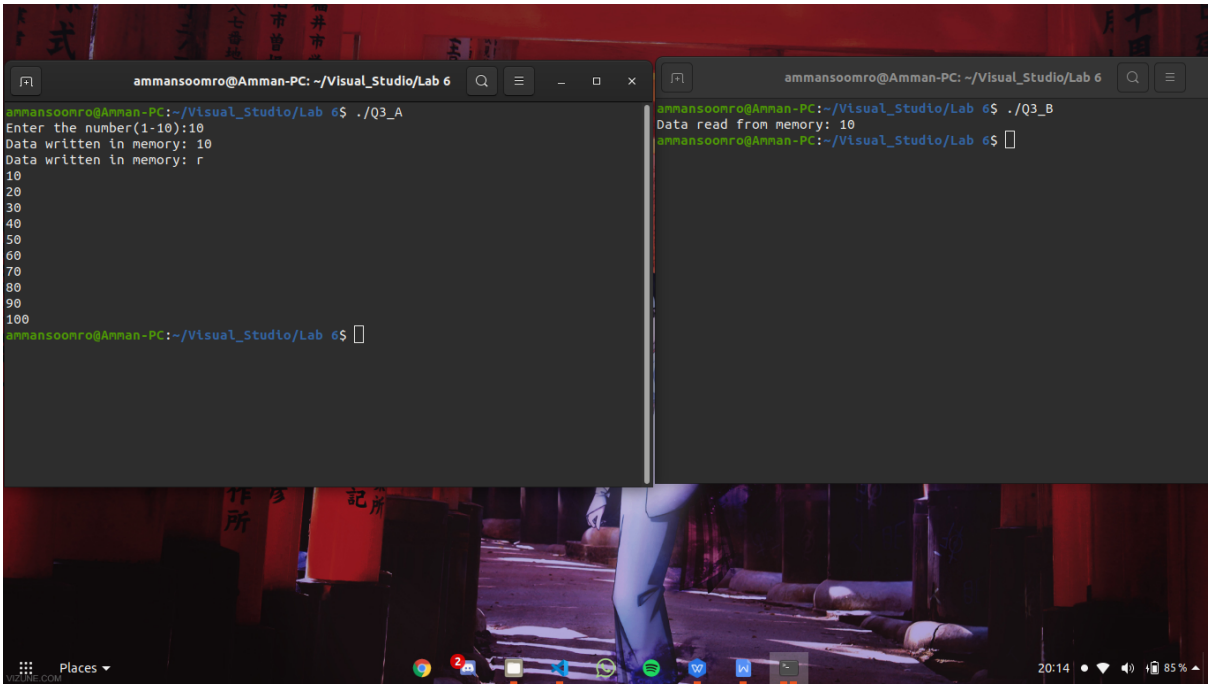
```
    return;
}
```



Task 4

File A

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

void main(){

   int num;
   key_t key = 1111;
   int shmid = shmget(key,1024,0666|IPC_CREAT);
   int *str =  shmat(shmid,(void*)0,0);
   *str=0;
   while(*str!='b');
   shmdt(str);
   shmctl(shmid,IPC_RMID,NULL);
   return;
}
```

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File B

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

void main(){

   int num;
   key_t key = 2222;
   int shmid = shmget(key,1024,0666|IPC_CREAT);
   int *str =  shmat(shmid,(void*)0,0);
   *str=1;
   while(*str!='b');
   shmdt(str);
   shmctl(shmid,IPC_RMID,NULL);
   return;
}
```

File C

```c
#include<sys/types.h>
#include<sys/ipc.h>
#include<sys/shm.h>
#include<stdio.h>
#include<stdlib.h>
void main(){

   int A,B,n;
   key_t key1 = 1111;
   key_t key2 = 2222;
   int shmid1 = shmget(key1,1024,0666|IPC_CREAT);
   int shmid2 = shmget(key2,1024,0666|IPC_CREAT);
   int *str1 =  shmat(shmid1,(void*)0,0);
   int *str2 =  shmat(shmid2,(void*)0,0);
   printf("Enter a Number:");
   scanf("%d",&n);
   printf("%d \n",*str1);
   printf("%d \n",*str2);
   while(n){
       A=*str1;
```

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```
        B=*str2;
        printf("%d \n",A+B);
        *str1=*str2;
        *str2=A+B;
        n--;
    }
    *str1='b';
    *str2='b';
    shmdt(str1);
    shmdt(str2);
    shmctl(shmid1,IPC_RMID,NULL);
    shmctl(shmid2,IPC_RMID,NULL);
    return;
}
```