```
root@orvi-MS-7C96:/home/orvi# nano
root@orvi-MS-7C96:/home/orvi#
root@orvi-MS-7C96:/home/orvi# nano
root@orvi-MS-7C96:/home/orvi# nano
root@orvi-MS-7C96:/home/orvi# gedit banking.c

(gedit:5698): dconf-WARNING **: 21:45:09.605: failed to commit changes to dconf: Failed to execute child process "dbus-launch" (No such file or directory)

(gedit:5698): dconf-WARNING **: 21:45:09.607: failed to commit changes to dconf: Failed to execute child process "dbus-launch" (No such file or directory)

(gedit:5698): dconf-WARNING **: 21:45:09.998: failed to commit changes to dconf: Failed to execute child process "dbus-launch" (No such file or directory)

(gedit:5698): dconf-WARNING **: 21:45:09.998: failed to commit changes to dconf: Failed to execute child process "dbus-launch" (No such file or directory)

(gedit:5698): dconf-WARNING **: 21:45:09.998: failed to commit changes to dconf: Failed to execute child process "dbus-launch" (No such file or directory)

** (gedit:5698): WARNING **: 21:48:28.003: Set document metadata failed: Setting attribute metadata::gedit-spell-language not supported

** (gedit:5698): WARNING **: 21:48:28.003: Set document metadata failed: Setting attribute metadata::gedit-encoding not supported

** (gedit:5698): WARNING **: 21:48:36.979: Set document metadata failed: Setting attribute metadata::gedit-spell-language not supported

** (gedit:5698): WARNING **: 21:48:36.980: Set document metadata failed: Setting attribute metadata::gedit-encoding not supported

** (gedit:5698): WARNING **: 21:48:45.832: Set document metadata failed: Setting attribute metadata::gedit-position not supported

(gedit:5698): dconf-WARNING **: 21:48:45.834: failed to commit changes to dconf: Failed to execute child process "dbus-launch" (No such file or directory)
root@orvi-MS-7C96:/home/orvi# gedit office_manage.c

(gedit:6029): dconf-WARNING **: 21:49:30.558: failed to commit changes to dconf: Failed to execute child process "dbus-launch" (No such file or directory)

(gedit:6029): dconf-WARNING **: 21:49:30.560: failed to commit changes to dconf: Failed to execute child process "dbus-launch" (No such file or directory)

(gedit:6029): dconf-WARNING **: 21:49:30.639: failed to commit changes to dconf: Failed to execute child process "dbus-launch" (No such file or directory)

(gedit:6029): dconf-WARNING **: 21:49:30.639: failed to commit changes to dconf: Failed to execute child process "dbus-launch" (No such file or directory)

(gedit:6029): dconf-WARNING **: 21:49:30.639: failed to commit changes to dconf: Failed to execute child process "dbus-launch" (No such file or directory)

** (gedit:6029): WARNING **: 21:54:07.097: Set document metadata failed: Setting attribute metadata::gedit-spell-language not supported

** (gedit:6029): WARNING **: 21:54:07.097: Set document metadata failed: Setting attribute metadata::gedit-encoding not supported

** (gedit:6029): WARNING **: 21:54:21.203: Set document metadata failed: Setting attribute metadata::gedit-position not supported

(gedit:6029): dconf-WARNING **: 21:54:21.205: failed to commit changes to dconf: Failed to execute child process "dbus-launch" (No such file or directory)
root@orvi-MS-7C96:/home/orvi# 
```

```
root@orvi-MS-7C96:/home/orvi# gcc -o office_manage.c
gcc: fatal error: no input files
compilation terminated.
root@orvi-MS-7C96:/home/orvi# gcc -o office_manage.c a
/usr/bin/ld: cannot find a: No such file or directory
collect2: error: ld returned 1 exit status
root@orvi-MS-7C96:/home/orvi# gcc  banking.c -o banking -lrt
root@orvi-MS-7C96:/home/orvi# gcc  office_manage.c -o office_manage -lrt
cc1: fatal error: office_manage.c: No such file or directory
compilation terminated.
root@orvi-MS-7C96:/home/orvi# gcc  office_manage.c -o office_manage
cc1: fatal error: office_manage.c: No such file or directory
compilation terminated.
root@orvi-MS-7C96:/home/orvi# gcc office_manage.c -o office_manage
cc1: fatal error: office_manage.c: No such file or directory
compilation terminated.
root@orvi-MS-7C96:/home/orvi# ls
'Ajaira '    banking     Desktop    Downloads    Music      Public     temp               Videos        YourName_1    YourName_2
 Ajaira.txt  banking.c   Documents  encription   Pictures   snap       Templates    yourId_4.txt   YourName1    YourName_3
root@orvi-MS-7C96:/home/orvi# gedit office_manage.c

(gedit:7042): dconf-WARNING **: 22:08:55.950: failed to commit changes to dconf: Failed to execute child process "dbus-launch" (No such file or directory)

(gedit:7042): dconf-WARNING **: 22:08:55.952: failed to commit changes to dconf: Failed to execute child process "dbus-launch" (No such file or directory)

(gedit:7042): dconf-WARNING **: 22:08:56.020: failed to commit changes to dconf: Failed to execute child process "dbus-launch" (No such file or directory)

(gedit:7042): dconf-WARNING **: 22:08:56.020: failed to commit changes to dconf: Failed to execute child process "dbus-launch" (No such file or directory)

(gedit:7042): dconf-WARNING **: 22:08:56.020: failed to commit changes to dconf: Failed to execute child process "dbus-launch" (No such file or directory)

** (gedit:7042): WARNING **: 22:10:31.726: Set document metadata failed: Setting attribute metadata::gedit-spell-language not supported

** (gedit:7042): WARNING **: 22:10:31.726: Set document metadata failed: Setting attribute metadata::gedit-encoding not supported

** (gedit:7042): WARNING **: 22:10:32.914: Set document metadata failed: Setting attribute metadata::gedit-spell-language not supported

** (gedit:7042): WARNING **: 22:10:32.914: Set document metadata failed: Setting attribute metadata::gedit-encoding not supported

** (gedit:7042): WARNING **: 22:10:34.057: Set document metadata failed: Setting attribute metadata::gedit-spell-language not supported

** (gedit:7042): WARNING **: 22:10:34.057: Set document metadata failed: Setting attribute metadata::gedit-encoding not supported

** (gedit:7042): WARNING **: 22:10:52.937: Set document metadata failed: Setting attribute metadata::gedit-spell-language not supported

** (gedit:7042): WARNING **: 22:10:52.937: Set document metadata failed: Setting attribute metadata::gedit-encoding not supported

** (gedit:7042): WARNING **: 22:11:05.452: Set document metadata failed: Setting attribute metadata::gedit-position not supported

(gedit:7042): dconf-WARNING **: 22:11:05.452: failed to commit changes to dconf: Failed to execute child process "dbus-launch" (No such file or directory)
root@orvi-MS-7C96:/home/orvi# ls
'Ajaira '    banking     Desktop    Downloads    Music      Pictures    snap    Templates    yourId_4.txt   YourName1    YourNmae_3
 Ajaira.txt  banking.c   Documents  encription   office_manage.c   Public    temp    Videos         YourName_1    YourName_2
root@orvi-MS-7C96:/home/orvi# gcc office_manage.c -o office_manage
root@orvi-MS-7C96:/home/orvi# 
```

```
(gedit:7042): dconf-WARNING **: 22:08:56.020: failed to commit changes to dconf: Failed to execute child process "dbus-launch" (No such file or directory)

(gedit:7042): dconf-WARNING **: 22:08:56.020: failed to commit changes to dconf: Failed to execute child process "dbus-launch" (No such file or directory)

** (gedit:7042): WARNING **: 22:10:31.726: Set document metadata failed: Setting attribute metadata::gedit-spell-language not supported

** (gedit:7042): WARNING **: 22:10:31.726: Set document metadata failed: Setting attribute metadata::gedit-encoding not supported

** (gedit:7042): WARNING **: 22:10:32.914: Set document metadata failed: Setting attribute metadata::gedit-spell-language not supported

** (gedit:7042): WARNING **: 22:10:32.914: Set document metadata failed: Setting attribute metadata::gedit-encoding not supported

** (gedit:7042): WARNING **: 22:10:34.057: Set document metadata failed: Setting attribute metadata::gedit-spell-language not supported

** (gedit:7042): WARNING **: 22:10:34.057: Set document metadata failed: Setting attribute metadata::gedit-encoding not supported

** (gedit:7042): WARNING **: 22:10:52.937: Set document metadata failed: Setting attribute metadata::gedit-spell-language not supported

** (gedit:7042): WARNING **: 22:10:52.937: Set document metadata failed: Setting attribute metadata::gedit-encoding not supported

** (gedit:7042): WARNING **: 22:11:05.452: Set document metadata failed: Setting attribute metadata::gedit-position not supported

(gedit:7042): dconf-WARNING **: 22:11:05.452: failed to commit changes to dconf: Failed to execute child process "dbus-launch" (No such file or directory)
root@orvi-MS-7C96:/home/orvi# ls
'Ajaira '     banking     Desktop     Downloads     Music         Pictures    snap    Templates    yourId_4.txt    YourName1     YourNmae_3
 Ajaira.txt   banking.c   Documents   encription    office_manage.c   Public      temp    Videos       YourName_1     YourName_2
root@orvi-MS-7C96:/home/orvi# gcc office_manage.c -o office_manage
root@orvi-MS-7C96:/home/orvi# ./banking
Provide Your Input From Given Options:
1. Type a to Add Money
2. Type w to Withdraw Money
3. Type c to Check Balance
a
Your selection: a
Your selection: a
Enter amount to be added:
a
Balance added successfully
Updated balance after addition:
660716392
Thank you for using
root@orvi-MS-7C96:/home/orvi# ./office_manage
Please enter the workspace name:
cse321
Workspace name sent to otp generator from log in: cse321
OTP generator received workspace name from log in: cse321
OTP sent to log in from OTP generator: 7934
OTP sent to mail from OTP generator: 7934
Mail received OTP from OTP generator: 7934
OTP sent to log in from mail: 7934
Log in received OTP from OTP generator: 7934
Log in received OTP from mail: 7934
OTP Verified
root@orvi-MS-7C96:/home/orvi# 
```

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

#define SHM_KEY 1234
#define PIPE_WRITE_END 1
#define PIPE_READ_END 0

struct shared {
        char sel[100];
        int b;
};

void process_opr(int shm_id, int pipe_fd[2]) {
        struct shared *shm_ptr;
```

```c
shm_ptr = (struct shared *) shmat(shm_id, NULL, 0);
if (shm_ptr == (void *) -1) {
perror("shmat");
exit(1);
}
char selection[100];
strcpy(selection, shm_ptr->sel);
int balance = shm_ptr->b;

printf("Your selection: %s\n", selection);

if (strcmp(selection, "a") == 0) {
printf("Enter amount to be added:\n");
int amount;
scanf("%d", &amount);
if (amount > 0) {
shm_ptr->b += amount;
printf("Balance added successfully\n");
printf("Updated balance after addition:\n%d\n", shm_ptr->b);
} else {
printf("Adding failed, Invalid amount\n");
}
} else if (strcmp(selection, "w") == 0) {
printf("Enter amount to be withdrawn:\n");
int amount;
scanf("%d", &amount);
if (amount > 0 && amount <= shm_ptr->b) {
shm_ptr->b -= amount;
printf("Balance withdrawn successfully\n");
printf("Updated balance after withdrawal:\n%d\n", shm_ptr->b);
} else {
printf("Withdrawal failed, Invalid amount\n");
}
} else if (strcmp(selection, "c") == 0) {
printf("Your current balance is:\n%d\n", shm_ptr->b);
} else {
printf("Invalid selection\n");
}

close(pipe_fd[PIPE_READ_END]);
write(pipe_fd[PIPE_WRITE_END], "Thank you for using", 20);
close(pipe_fd[PIPE_WRITE_END]);

shmdt(shm_ptr);
```

```c
        exit(0);
}

int main() {
        int shm_id;
        int pipe_fd[2];
        pid_t child_pid;

        shm_id = shmget(SHM_KEY, sizeof(struct shared), IPC_CREAT | 0666);
        if (shm_id < 0) {
        perror("shmget");
        exit(1);
        }

        struct shared *shm_ptr;
        shm_ptr = (struct shared *) shmat(shm_id, NULL, 0);
        if (shm_ptr == (void *) -1) {
        perror("shmat");
        exit(1);
        }

        if (pipe(pipe_fd) == -1) {
        perror("pipe");
        exit(1);
        }

        printf("Provide Your Input From Given Options:\n");
        printf("1. Type a to Add Money\n");
        printf("2. Type w to Withdraw Money\n");
        printf("3. Type c to Check Balance\n");
        char user_input[100];
        scanf("%s", user_input);

        strcpy(shm_ptr->sel, user_input);
        shm_ptr->b = 1000;

        printf("Your selection: %s\n", user_input);

        child_pid = fork();
        if (child_pid < 0) {
        perror("fork");
        exit(1);
        }
```

```c
        if (child_pid == 0) {
        process_opr(shm_id, pipe_fd);
        } else {
        wait(NULL);
        char buffer[20];
        close(pipe_fd[PIPE_WRITE_END]);
        read(pipe_fd[PIPE_READ_END], buffer, sizeof(buffer));
        close(pipe_fd[PIPE_READ_END]);

        printf("%s\n", buffer);

        shmctl(shm_id, IPC_RMID, NULL);
        }

        return 0;
}
```

Task-2
```c
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
#include <sys/msg.h>
#include <string.h>
#include <sys/types.h>
#include <sys/wait.h>

struct msg {
        long int type;
        char txt[6];
};

int main() {
        int msgid;
        key_t key = 1234;
        struct msg message;

        msgid = msgget(key, 0666 | IPC_CREAT);
        if (msgid < 0) {
        perror("msgget failed");
        exit(1);
        }

        printf("Please enter the workspace name:\n");
        char workspace[10];
```

```c
scanf("%s", workspace);

if (strcmp(workspace, "cse321") != 0) {
printf("Invalid workspace name\n");
exit(0);
}

message.type = 1;
strcpy(message.txt, "cse321");
msgsnd(msgid, &message, sizeof(message), 0);
printf("Workspace name sent to otp generator from log in: %s\n", message.txt);

pid_t pid1 = fork();

if (pid1 == 0) {
msgrcv(msgid, &message, sizeof(message), 1, 0);
printf("OTP generator received workspace name from log in: %s\n", message.txt);

int otp = getpid();
sprintf(message.txt, "%d", otp);
message.type = 2;
msgsnd(msgid, &message, sizeof(message), 0);
printf("OTP sent to log in from OTP generator: %s\n", message.txt);

message.type = 3;
msgsnd(msgid, &message, sizeof(message), 0);
printf("OTP sent to mail from OTP generator: %s\n", message.txt);

pid_t pid2 = fork();

if (pid2 == 0) {
msgrcv(msgid, &message, sizeof(message), 3, 0);
printf("Mail received OTP from OTP generator: %s\n", message.txt);

message.type = 4;
msgsnd(msgid, &message, sizeof(message), 0);
printf("OTP sent to log in from mail: %s\n", message.txt);
exit(0);
} else {
wait(NULL);
exit(0);
}
} else {
wait(NULL);
```

```c
        msgrcv(msgid, &message, sizeof(message), 2, 0);
        printf("Log in received OTP from OTP generator: %s\n", message.txt);
        char otp_from_gen[6];
        strcpy(otp_from_gen, message.txt);

        msgrcv(msgid, &message, sizeof(message), 4, 0);
        printf("Log in received OTP from mail: %s\n", message.txt);

        if (strcmp(otp_from_gen, message.txt) == 0) {
        printf("OTP Verified\n");
        } else {
        printf("OTP Incorrect\n");
        }

        msgctl(msgid, IPC_RMID, NULL);
        }
        return 0;
}
```