

In this assignment we will pass messages between independent processes. The main program will create four child processes using the fork system call. These four processes will exec to execute a new program. Each of the four child processes will send a message to the other four processes. After receiving messages from each of the three other processes, a child process will send a message to the parent process and terminate. The parent process will terminate after receiving the four messages from the child processes. You need to check the sender number for each message, and check off each sender. DO NOT simply count messages. For future reference the parent process will be designated as Process 1, and the four child processes will be designated Process 2, Process 3, Process 4, and Process 5. (DO NOT USE ZERO.)

Here's how you create a message queue.

Place the following includes in your program:

```
#include <sys/types.h>
#include <sys/ipc.h>
#include <sys/msg.h>
```

Get a handle to the message queue using the following function call:

```
int MyMsgId = msgget(MyLastFour, IPC_CREAT|0x1c0);
```

The first parameter is the last four digits of your ssn. The second parameter is is constant. To destroy the message queue use the following function call:

```
msgctl(MyMsgId, IPC_RMID, NULL);
```

To send a message do the following:

Create a structure with the following format:

```
struct MyMsg
{
    long Receiver;
    long Sender;
};
```

Create a variable of this type:

```
MyMsg Message;
```

Fill it in as follows: (do this in your message-sending loop.)

```
Message.Receiver = ReceiverNumber; // Number 1-5, who you are sending to
Message.Sender = SenderNumber; // Number 1-5, your own ID.
```

Send the message using the following function call.

```
msgsnd(MyMsgId,&Message,sizeof(long),0);
```

To receive a message use the same structure in the receiving process and declare the same variable, Message. Use the following function call to obtain the message data.

```
msgrcv(MyMsgId,&Message,sizeof(long),ReceiverNumber,0); // ReceiverNumber is your own ID.
```