

```
#include <stdlib.h>
#include <string.h>
#include <ctype.h>
```

```
#define MAXPAROLA 30
#define MAXRIGA 80
```

```
int main(int argc, char *argv[])
{
    int freq[MAXPAROLA]; /* vettore di contatori
delle frequenze delle lunghezze delle parole */
    char riga[MAXRIGA];
    int i, inizio, lunghezza;
    FILE *f;
```

```
for(i=0; i<MAXPAROLA; i++)
    freq[i]=0;
```

```
if(argc != 2)
```

```
{
    fprintf(stderr, "ERRORE, serve un parametro con il nome del file\n");
    exit(1);
}
```

```
f = fopen(argv[1], "r");
if(f==NULL)
```

```
{
    fprintf(stderr, "ERRORE, impossibile aprire il file %s\n", argv[1]);
    exit(1);
}
```

```
while( fgets( riga, MAXRIGA, f ) != NULL )
```



System and Device Programming

UNIX IPC

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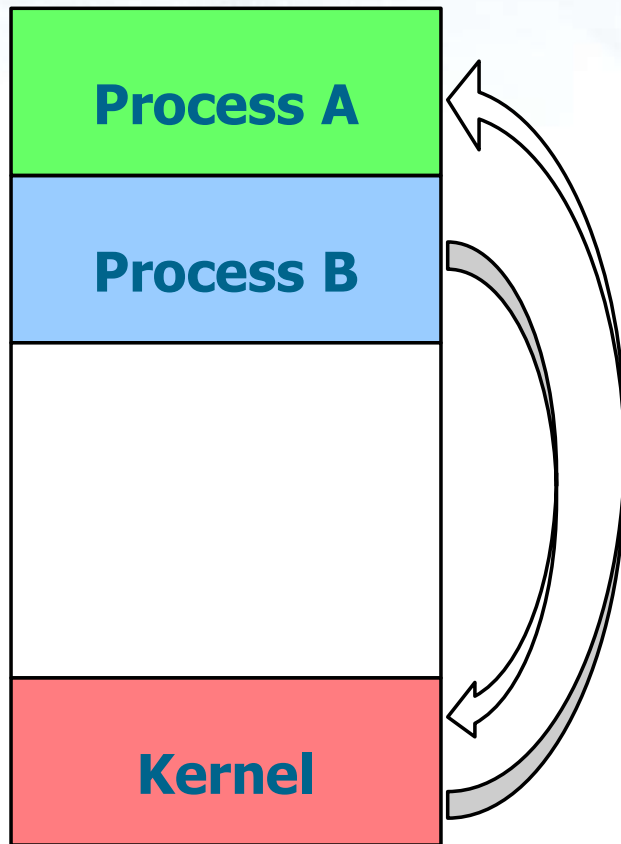
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Inter-Process Communication

- ❖ Information sharing among processes is referred to as **IPC** or **InterProcess Communication**
- ❖ The main communication models are based on
 - Message exchange
 - Shared memory

Communication models

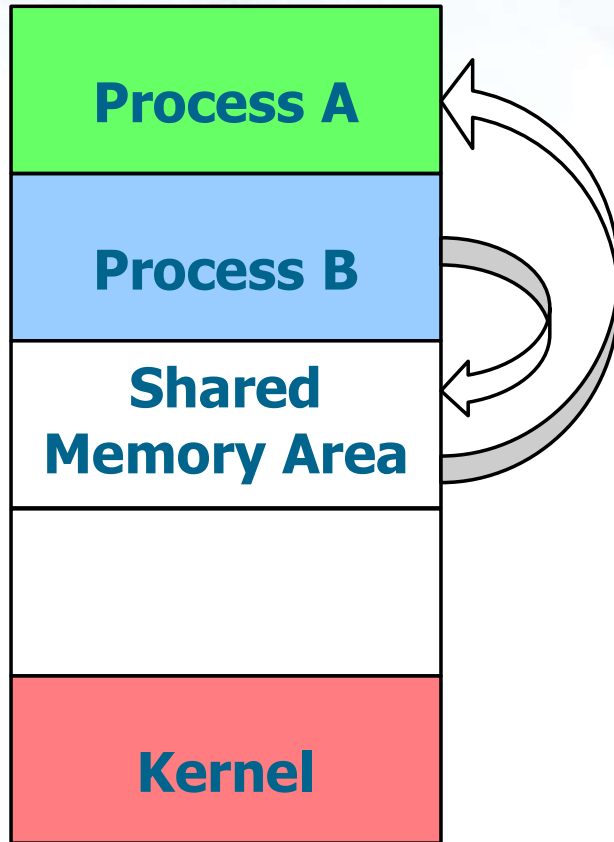


❖ Message exchange

- Communication takes place through the exchange of messages
- Need to setup of a communication channel
- Useful for exchanging limited amounts of data
- Uses system calls
 - Require kernel intervention
 - Introduce overhead

Pipe: Direct, Synchronous,
Limited capacity

Communication models



❖ Shared memory

- Used for sharing a large amount of data
- Based on sharing a memory area and writing of data in this area
- Most common methods
 - **File sharing**
 - Sharing the name or the file pointer or descriptor before `fork/exec`
 - **Mapped file in memory**
 - A file mapped in memory associates a shared memory region to a file

Communication channels

❖ UNIX makes available

- **Half-duplex pipes**
- FIFOs
- Full-duplex pipes
- Named full-duplex pipes
- Message queues
- Semaphores
- Sockets
- STREAMS

Extensions of the original half-duplex pipes

For process synchronization

Network process communication.
Each process is identified by a socket to which it is associated a network address

Not all the types of communication are supported by all the UNIX versions

Used starting from UNIX System V