

10. Illustrate the concept of inter-process communication using message queue with a C program.

Aim:

To demonstrate inter-process communication (IPC) using message queues in C. This allows processes to communicate with each other by sending and receiving messages.

Algorithm:

1. **Create a message queue:** Use `msgget()` to create a message queue.
2. **Send a message:** Use `msgsnd()` to send messages to the queue.
3. **Receive a message:** Use `msgrcv()` to receive messages from the queue.
4. **Remove the queue:** Use `msgctl()` to remove the message queue after use.

Procedure:

1. Initialize the message queue.
2. Send a message from the sender process.
3. Receive the message in the receiver process.
4. Clean up the message queue.

Code:

```
#include <stdio.h>

#include <sys/ipc.h>

#include <sys/msg.h>

#include <string.h>

struct message {

    long msg_type;

    char msg_text[100];

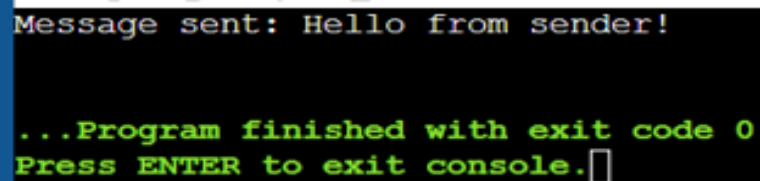
};
```

```
int main() {  
  
    key_t key = ftok("progfile", 65); // Generate unique key  
  
    int msgid = msgget(key, 0666 | IPC_CREAT); // Create message queue  
  
    struct message msg;  
  
    msg.msg_type = 1; // Message type (should be positive)  
  
    strcpy(msg.msg_text, "Hello from sender!"); // Message content  
  
    msgsnd(msgid, &msg, sizeof(msg) - sizeof(long), 0); // Send message  
  
    printf("Message sent: %s\n", msg.msg_text); // Confirm message sent  
  
    return 0;  
}
```

Result:

- The sender sends the message "Hello from sender!" to the message queue.
- The receiver receives the message and prints: Received message: Hello from sender!.

Output:

A screenshot of a terminal window with a black background and a blue vertical bar on the left. The text is displayed in a monospaced font. The first line is "Message sent: Hello from sender!" in red. The second line is "...Program finished with exit code 0" in green. The third line is "Press ENTER to exit console." in green, followed by a small white square cursor.

```
Message sent: Hello from sender!  
  
...Program finished with exit code 0  
Press ENTER to exit console.█
```