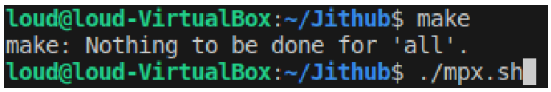
JitHub Users Manual

Version 4

10/31/2023

Startup

To boot the operating system, navigate to the JitHub directory. Once there, type “make” to compile the program. Finally, type “./mpx.sh” to run the OS

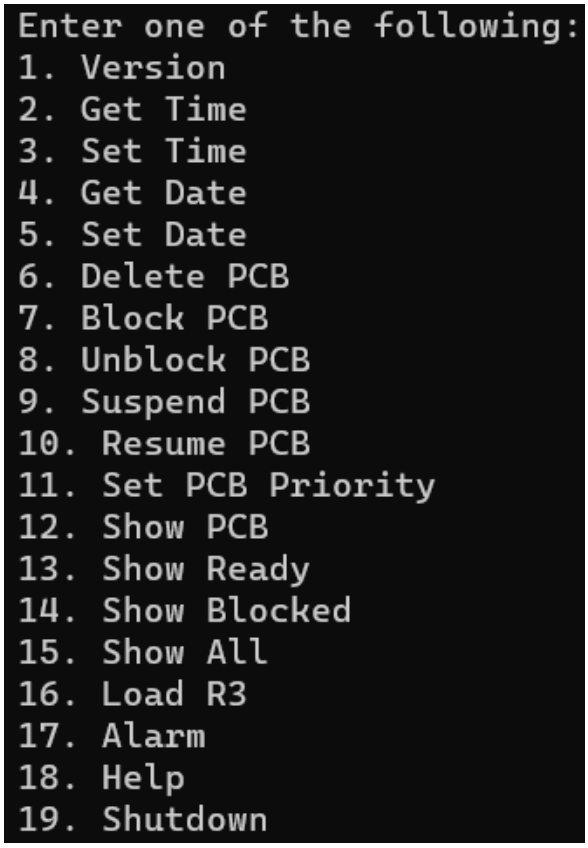


.

Menu

Upon startup, the operating system provides a menu with a list of commands.

- Enter any of the following to continue.



Version

Type "version" or type '1' to retrieve the current version of the operating system
Version includes:

- The module it was updated during
- The compilation date and time

```
>> version
Release Number: 4
Date of most recent compile: Oct 30 2023
Time of most recent compile: 02:36:38
IDLE PROCESS EXECUTING.
```

Get Time

Type "get time" or '2' to retrieve the current system time

- Retrieves the current time which may be updated using "set time"

```
>> get time
Time is: 17:20:58
```

Set Time

Type "set time" or type '3' to set the system time

- The system will then display a prompt to input the time in hh:mm:ss format

```
>> set time
Enter the time. (hh:mm:ss)
>> 1:44:00
Time set to 01:44:00.
```

Get Date

Type "get date" or type '4' to retrieve the current system date

- Retrieves the current date that may be updated with "set date"

```
>> get date
Date: 9/08/23
```

Set Date

Type "set date" or type '5' to set the system date

- The system will then display a prompt to input the date in mm/dd/yy format

```
>> set date
Enter the date. (mm/dd/yy)
>> 1/1/24
Date set to 01/01/24
```

Delete PCB

Type “create PCB” or type “6” to delete a process

- A prompt will appear asking for a process name
  - If the process exists, a success message will be displayed

```
>> delete pcb
Enter PCB name:
>> UserProcess
Successfully deleted process "UserProcess".
```

  - If the process does not exist, an error message will be displayed

```
>> 7
Enter PCB name:
>> test
Could not find process "test" to delete.
```

- Only a user process can be deleted
  - An error message will be displayed if a kernel process tries to be deleted

```
>> 7
Enter PCB name:
>> JithubPCB
Error: "JithubPCB" is a system process. Cannot request to delete a system process.
```

Block PCB

Type “Block PCB” or type “7” to block a process

- Blocking a process will move it from Ready to Blocked or from SuspendedReady to SuspendedBlocked
- A prompt will appear asking for a process name
  - If the process blocks, a success message will be displayed

```
>> Block PCB
Enter PCB name:
>> UserProcess
Successfully blocked process "UserProcess".
```

  - If the process does not block, an error message will be displayed

```
>> Block PCB
Enter PCB name:
>> otherprocess
Could not find process "otherprocess" to block.
```

- Only a user process can be blocked

- An error message will be displayed if a kernel process tries to be blocked

```
>> 8
Enter PCB name:
>> JithubPCB
Cannot block system process "JithubPCB".
```

Unblock PCB

Type "Unblock PCB" or type "8" to unblock a process

- A prompt will appear asking for a process name
  - If the process unblocks, a success message will be displayed

```
>> 9
Enter PCB name:
>> UserProcess
Successfully unblocked process "UserProcess".
```

  - If the process does not block, an error message will be displayed

```
>> unblock PCB
Enter PCB name:
>> otherprocess
Could not find process "otherprocess" to unblock.
```

- A system process will never need to be unblocked

```
>> 9
Enter PCB name:
>> JithubPCB
The specified PCB "JithubPCB" is already in the ready state. Nothing will be done.
```

Suspend PCB

Type "Suspend PCB" or type "9" to suspend a process

- Suspending a process will move it from Ready to Suspended or from Blocked to SuspendedBlocked
- A prompt will appear asking for a process name
  - If the process suspends, a success message will be displayed

```
>> 10
Enter PCB name:
>> UserProcess
Successfully suspended process "UserProcess".
```

  - If the process does not suspend, an error message will be displayed

```
>> suspend pcb
Enter PCB name:
>> otherprocess
Could not find process "otherprocess" to suspend.
```

- Only a user process can be suspended
  - An error message will be displayed if a kernel process tries to be blocked

```
>> 10
Enter PCB name:
>> JithubPCB
Cannot suspend system process "JithubPCB".
```

Resume PCB

Type "resume PCB" or "10" to resume the given process. Resuming a process means "unsuspending" it

- After typing "resume PCB", you will be prompted to provide the name of the PCB to resume
  - If the process resumes, a success message will be displayed

```
>> Resume PCB
Enter PCB name:
>> UserProcess
Successfully resumed process "UserProcess".
```

- The given process must already be in either the "suspended ready" or "suspended blocked" queue
- If the process is in the "suspended ready" queue, it will move to the ready queue
- If the process is in the "suspended blocked" queue, it will move to the blocked queue
- A System process will never need to be resumed

Set PCB Priority

Type "set PCB priority" or "11" to change the priority of a process

- After typing "set PCB priority", you will be prompted to provide the name of the PCB
- The priority must be a valid integer from 0 to 9

```
>> 12
Enter PCB name:
>> UserProcess
Enter PCB priority:
>> 6
Successfully changed priority for UserProcess from 5 to 6.
```

Show PCB

Type “show PCB” or “12” to show a specific PCB

- After entering “show PCB”, you will be prompted to provide the name of the PCB to show
- The PCB name must be an existing process in one of the queues

```
>> show pcb
Enter PCB name:
>> otherPCb
Could not find process "otherPCb" to show.
```

- The name, priority, class, and state of the requested process are printed

```
>> show pcb
Enter PCB name:
>> UserProcess
PCB "UserProcess"--
        Name:      UserProcess
        Class:     1
        State:     ready
        Suspended: No
        Priority:  5
```

Show Ready

Type “show ready” or “13” to show all processes in the ready queue

- Each ready process’s name, priority, and class are printed

```
>> show ready
Ready:
  |      Name:      Test          |
  |      Class:     1             |
  |      State:     ready         |
  |      Suspended: No            |
  |      Priority:  1             |
```

Show Blocked

Type “show blocked” or “14” to show all processes in the blocked queue

- Each blocked process’s name, priority, and class are printed

```
>> show blocked
Blocked:
  |      Name:      Test         |
  |      Class:     1            |
  |      State:     blocked      |
  |      Suspended: No           |
  |      Priority:  1            |
```

Show All

Type “show all” or “15” to show all processes in all queues

- Each process’s name, priority, class, and state are printed
- The queues will be printed in the following order: Ready, Blocked, Suspended Ready, Suspended Blocked

```
>> show all
Ready:
  |                              |
  |        QUEUE IS EMPTY        |
  |                              |

Blocked:
  |      Name:      Test         |
  |      Class:     1            |
  |      State:     blocked      |
  |      Suspended: No           |
  |      Priority:  1            |
Suspended Ready:
  |                              |
  |        QUEUE IS EMPTY        |
  |                              |

Suspended Blocked:
  |                              |
  |        QUEUE IS EMPTY        |
  |                              |
```

Load R3

Type "Load R3" or type ‘16’ to load the R3 premade processes into the ready queue.

- After Loading R3 and viewing the Ready queue, processes can be seen

```
Ready:
       Name          Class         State         Suspended          Priority
       proc2         1             ready         No                 2
       proc3         1             ready         No                 2
       proc4         1             ready         No                 2
       proc5         1             ready         No                 2
       proc1         1             ready         No                 2
       idle          0             ready         No                 9
```

- Load R3 can be run multiple times but will not create more than 1 of the same process.

Alarm

Type “alarm” or ‘17’ to create a new alarm process that goes off at a set time and displays a set message.

- You will be prompted for a name for the alarm

```
>> alarm
Enter alarm name:
>> myAlarm
```

- You will be prompted to enter a time that the alarm will go off. This time must be in the hh:mm:ss format

```
Enter a time for the alarm (hh:mm:ss):
>> 01:27:20
```

- You will be prompted for a message that will display when the timer goes off

```
Enter a message for the alarm to display when the timer goes off (100 character limit):
>> We love CS450
```

- When comhand IDLEs and the time for the alarm to go off has passed, the message will display

```
We love CS450
```

Help

Type "help" or type ‘18’ to see a list of commands you can run

```
>> 18
Type "version" or type ‘1’to retrieve the current version of the operating system
Type "get time" or type ‘2’ to retrieve the current system time
Type "set time" or type ‘3’ to set the system time
Type "get date" or type ‘4’ to retrieve the current system date
Type "set date" or type ‘5’ to set the system date
Type "Delete PCB" or type ‘6’ to delete a PCB
Type "Block PCB" or type ‘7’ to block a PCB
Type "Unblock PCB" or type ‘8’ to unblock a PCB
Type "Suspend PCB" or type ‘9’ to suspend a PCB
Type "Resume PCB" or type ‘10’ to resume PCB
Type "Set PCB Priority" or type ‘11’ to update a PCB's priority
Type "Show PCB" or type ‘12’ to show details of a specific PCB
Type "Show Ready" or type ‘13’ to show PCB's in the ready queue
Type "Show Blocked" or type ‘14’ to show PCB's in the blocked queue
Type "Show All" or type ‘15’ to show all PBC's in all the queues
Type "Load R3" or type ‘16’ to load the processes created to test R3 into the ready queue
Type "Alarm" or type ‘17’ to set an alarm that prints a message at a given time
Type "help" or type ‘18’ to see a list of commands you can run
Type "shutdown" or type ‘19’ to exit the operating system
```

- Additionally, type “help” followed by any menu command to get help specific to that instruction

```
>> help get time
Type "get time" to retrieve the current system time
```

Shutdown

Type "shutdown" or type ‘19’ to exit the operating system

- A confirmation prompt will appear. Type ‘y’ or ‘n’ to confirm or cancel.

```
>> 19
Confirm Shutdown? Y/N
y
klogv: Starting system shutdown procedure...
klogv: Halting CPU...
```