The C Team Users Manual
Version 6
12/05/2024

Startup

To initially boot the program navigate to 'The C Team' directory and run 'make' to compile the code. Finally, type './mpx.sh' to run the operating system.

```
● (base) loganw@Logans-MacBook-Pro-4 TheCTeam % make
  make: Nothing to be done for `all'.
○ (base) loganw@Logans-MacBook-Pro-4 TheCTeam % ./mpx.sh
```

Intro Sequence

When initially booting into the program you are greeted with a custom welcome sequence and a command line to read input. You are instructed to type "help" in order to have information on what the programs are and how to utilize them.

```
 C TEAM OS
================================================================
Running 'The C Team', Type 'help' for information on commands
================================================================
The C Team OS: █
```

Help

Type 'help' in order to get more information about what the respective commands of the OS are. You can then use sub-help commands to get more descriptive information on how to use commands as instructed at the top of the help display.

```
========================================================
                   Help Commands
========================================================
Use a space as a delimiter between commands.
Example: 'Help Date' For more information on date commands.
========================================================
Shutdown: Asks for confirmation and exits the program.
Version: Displays the current build version along with the build date.
Clear: Clears the terminal.
load r3: Loads 5 provided processes to run. Use 'yield' to run processes.
load r3 suspended: Loads 5 provided processes in a suspended state. To run you must unsuspend the processes and use 'yield'.
yield: Runs any current ready nonsuspended processes.
Date:
        Get
        Set
Pcb:
        Delete
        Suspend
        Block
        Unblock
        Resume
        Priority
Show:
        PCB
        Ready
        Blocked
        All

The C Team OS: █
```

Help Date

Type 'help date' in order to get in depth information on how to utilize the date commands.

```
=============
Date Commands
=============
Date Get: Prints the current date and time in MM-DD-YY HH:MM:SS format
Date Set: Sets both the system date and time using MM-DD-YY HH:MM:SS format
          Example: 12-04-14 11:36:22
The C Team OS: ▯
```

Help PCB

Type 'help pcb' in order to get in depth information on how to utilize the pcb commands.

```
The C Team OS: help pcb
=============================================================
                     PCB Commands
=============================================================
PCB Delete:
Deletes an existing PCB.
        Usage: 'pcb delete <name>'
        name: The name of the process set during creation

PCB Suspend:
Suspends a given PCB.
        Usage: 'pcb suspend <name>'
        name: The name of the process set during creation

PCB Unblock:
Unblocks a given PCB.
        Usage: 'pcb unblock <name>'
        name: The name of the process set during creation

PCB Resume:
Resumes a given PCB.
        Usage: 'pcb resume <name>'
        name: The name of the process set during creation

PCB Priority:
Sets the priority of a given PCB.
        Usage: 'pcb priority <name> <priority>'
        name: The name of the process set during creation
        priority: number 0-9, lower is higher priority

The C Team OS:
```

Help Show

Type 'help show' in order to get in depth information on how to utilize the show commands.

```
=============
Show Commands
=============
Show PCB: Shows a given PCBs information
Show Ready: Shows the information of all PCBs in the ready queues
Show Blocked: Shows the information of all PCBs in the blocked queues
Show All: Shows the information of all PCBs in all queues
The C Team OS:
```

Shutdown

Type 'Shutdown' in order to exit the operating system. Additionally, a confirmation message will be displayed prompting you to type either 'y' to confirm the shutdown or 'n' to cancel the shutdown.

```
The C Team OS: shutdown
Confirm Shutdown? Y/n:
The C Team OS: y
Shutdown confirmed...
klogv: Starting system shutdown procedure...
klogv: Halting CPU...
(base) loganw@Logans-MacBook-Pro-4 TheCTeam %
```

Version

Type 'version' to display the current version of the operating system which includes the most recent compilation date and the name given to that specific version.

```
The C Team OS: version
The current version of 'The C Team' is the R2 build.
The date of final implementaion was 10/04/24.
The C Team OS: 
```

Date Get

Type 'date get' to get both the system date and time. This date can be updated with the 'date set' command.

```
The C Team OS: date get
MM-DD-YY HH:MM:SS
10-02-24 05:41:34
The C Team OS: 
```

Date Set

Sets the current system date and time. Input should be formatted as follows: 'date set MM-DD-YY HH:MM:SS' where MM is the month, DD is the day, YY is the year, HH is the hour, MM is the minute, and SS is the second.

```
The C Team OS: date set 10-02-14 01:45:20
date set successfully
```

PCB Delete

Deletes a current PCB. This removes the pcb from the queue and fully deletes and frees the memory. Input should be formatted as follows: "Pcb delete <name>" where name is the name of the pcb you want to delete.

```
The C Team OS: pcb delete test
PCB successfully deleted
The C Team OS: 
```

PCB Suspend

Suspends a given pcb to the suspended queue. Input should be formatted as follows: "Pcb Suspend <name>" where name is the name of the pcb you want to suspend. System Processes cannot be suspended.

```
The C Team OS: pcb suspend test
PCB successfully suspended
The C Team OS: 
```

PCB Block

Blocks a given pcb and adds it to the blocked queue. Input should be formatted as follows: "Pcb block <name>" where name is the name of the pcb you want to block. System Processes cannot be blocked.

```
The C Team OS: pcb block test
PCB successfully moved to blocked queue
The C Team OS: 
```

PCB Unblock

Unblocks a given pcb and moves it to the ready queue. Input should be formatted as follows: "Pcb unblock <name>" where name is the name of the pcb you want to unblock.

```
The C Team OS: pcb unblock test
PCB successfully unblocked
The C Team OS: 
```

PCB Resume

Resumes a given pcb which moves it off of the suspended queue. Input should be as follows: "Pcb resume <name>" where name is the name of the pcb you want to resume.

```
The C Team OS: pcb resume test
PCB successfully resumed
The C Team OS: █
```

PCB Priority

Changes the priority of a given PCB. Input should be as follows: "pcb priority <name> <number>"

```
The C Team OS: pcb priority test 4
PCB priority successfully changed to: 4
```

Show PCB

Displays a given PCBs information, including the name, class, state, status, and priority. Input should be as follows: "show pcb <name>".

```
The C Team OS: show pcb test
Name: test
Class: USER_PROCESS
State: READY
Status: NOT SUSPENDED
Priority: 0
```

Show Ready

Displays all processes and process information (as shown in the "show pcb" command) within both the ready queue and the suspended ready queue. Proper usage is as follows: "show ready".

```
The C Team OS: show ready
Printing Ready Queue:
Name: test
Class: USER_PROCESS
State: READY
Status: NOT SUSPENDED
Priority: 0

Printing Suspended Ready Queue:
This queue is empty
```

Show Blocked

Displays all processes and process information (as shown in the "show pcb" command) within both the blocked queue and the suspended blocked queue. Proper usage is as follows: "show blocked".

```
The C Team OS: show blocked
Printing Blocked Queue:
Name: blockedpcb
Class: USER_PROCESS
State: BLOCKED
Status: NOT SUSPENDED
Priority: 0

Printing Suspended Blocked Queue:
This queue is empty
```

Show All

Displays all processes within all queues, including the ready queue, suspended ready queue, blocked queue, and suspended blocked queue. Proper usage is as follows: "show all".

```
The C Team OS: show all
Printing Ready Queue:
Name: test
Class: USER_PROCESS
State: READY
Status: NOT SUSPENDED
Priority: 0

Printing Suspended Ready Queue:
This queue is empty
Printing Blocked Queue:
Name: blockedpcb
Class: USER_PROCESS
State: BLOCKED
Status: NOT SUSPENDED
Priority: 0

Printing Suspended Blocked Queue:
This queue is empty
```

Clear

Blanks the terminal and moves the cursor to the top of the terminal. Correct usage is "clear".

Before using clear:


```
Printing Suspended Blocked Queue:
This queue is empty
The C Team OS: pcb create test 0 0
PCB created successfully
The C Team OS: show all
Printing Ready Queue:
Name: test
Class: USER_PROCESS
State: READY
Status: NOT SUSPENDED
Priority: 0

Printing Suspended Ready Queue:
This queue is empty
Printing Blocked Queue:
Name: blockedpcb
Class: USER_PROCESS
State: BLOCKED
Status: NOT SUSPENDED
Priority: 0

Printing Suspended Blocked Queue:
This queue is empty
The C Team OS:
```

After using clear:


```
The C Team OS: |
```

Load R3

Loads 5 given processes to us for use. These processes are all ready and non suspended. Usage: "load r3".

```
The C Team OS: load r3
Creating Process: process1
Creating Process: process2
Creating Process: process3
Creating Process: process4
Creating Process: process5
The C Team OS:
```

Load R3 Suspended

Exact same as load r3. Except the processes are loaded as suspended meaning that they will not run any unless each is manually unsuspended.

```
The C Team OS: load r3 suspended
Creating Process: process1
Creating Process: process2
Creating Process: process3
Creating Process: process4
Creating Process: process5
PCB successfully suspended
PCB successfully suspended
PCB successfully suspended
PCB successfully suspended
PCB successfully suspended
The C Team OS:
```

Alarm

Creates a message that is read out to the user at the given time. Usage: "Alarm create <time> <message> where <time> is the time you want the alarm to go off in 00:00:00 format and <message> is the message that will be read out. The alarm name will be the current system time.

```
The C Team OS: date get
MM-DD-YY HH:MM:SS
11-01-24 03:00:09
IDLE PROCESS EXECUTING.
The C Team OS: alarm create 03:00:30 test
Creating Process: 030020
The C Team OS: date get
MM-DD-YY HH:MM:SS
11-01-24 03:00:29
The C Team OS:
test
The C Team OS: █
```

Show Free

Shows all the free memory addresses as hexadecimal.
Usage: "show free" which displays the list of the start address and the size of the block in decimal.

```
The C Team OS: show free
Free Memory Blocks:
Address: 0xd001910
Size: 43604
IDLE PROCESS EXECUTING.
```

Show Allocated

Shows all the allocated memory address as hexadecimal.

Usage: "show allocated" which prints the list of both the start address and size of the block in decimal.

```
The C Team OS: show allocated
Allocated Memory Blocks:
Address: 0xd000014
Size: 1056
Address: 0xd000448
Size: 64
Address: 0xd00049c
Size: 8
Address: 0xd0004b8
Size: 1056
Address: 0xd0008ec
Size: 64
Address: 0xd000940
Size: 8
IDLE PROCESS EXECUTING.
```