**User’s Manual**

**R1**

There are currently 4 commands you can use: **help**, **version**, **shutdown**, and **date**.

**Basic Commands:**

**Help:** Typing “help” and then any valid command will produce information about what the command does and shows examples of how it is used.

**Note:** When reading information from **help** you notice square brackets “[ ]” that means that part is optional

**Version:** Typing “version” will display the current version of the Operating System. It will always display “NPE-NPX” and then “.XX.XXXXXXXX”, The first two places being the current module and the other six representing the date it was due. For example, if the current module being implemented was R3 and the due date was the 10th of March in 2017 then the version would be “NPE-NPX.R3.03102017”

**Shutdown:** Typing “shutdown” will prompt the OS to ask you if you want to shut down, if “y” is typed, the OS shuts down. If “n” is typed, then the OS will resume running.

**Date and Time Commands:**

**Date:** Typing “date” will display the current date, and time.

Typing “date --date” will only display the current date.

**Time:** Typing “date --time” will display the current time.

**Setting the date:** Typing “date –setdate yyyy-MM-dd” where the Y’s are the year, the M’s are the month and the D’s are the day. It will then display the now changed date.

**Setting the time:** Typing “date –settime hh:mm:ss” where H’s are hours, M’s are minutes and S’s are seconds. It will then display the now changed time

**R2**

**Process Control Blocks Commands:**

These commands allow you to manipulate the process control blocks, also called PCB in the OS.

**Permanent Commands:**

**Suspend PCB:** Typing “spcb” followed by a valid and existing process name will place a PCB in the suspended state and reinsert it into the appropriate queue.

Example: $> spcb calculator

**Resume PCB:** Typing “rpcb” followed by a valid and existing process name will place a PCB in the not suspended state and reinserts it into the appropriate queue.

Example: $> rpcb calculator

**Set PCB Priority:** Typing “ppcb” followed by a valid and existing process name and a valid priority will set a PCB's priority and reinserts the process into the correct place in the correct queue.

Example: $> ppcb calculator 7

**Show PCB:** Similar to the date command**,** there are multiple commands combined into one. Typing just “showpcb” will display a help menu. Typing “showpcb --name” will display only that PCB’s respective information. Typing “showpcb --ready” will display information for each PCB in the ready queue. Typing “showpcb --blocked” will display information for each PCB in the blocked queue. Typing “showpcb --all” will display information for each PCB in both the ready and blocked queues. The PCB information which will be displayed is the process name, the class, the state, the suspended status, and the priority.

**Temporary Commands:**

These commands will be removed in a future version.

**Create PCB:** Typing “cpcb” followed by a valid name, class, and priority for it will create a PCB and place it in the appropriate queue. A valid name is one word composed of any combination of characters or numbers. A valid class is either a 0 representing a system process or a 1 representing an application process. A valid priority is a number from 0 to 9. 9 being the highest, 0 being the lowest.

Example: $> cpcb calculator 1 3

**Delete PCB:** Typing “dpcb” followed by a valid and existing process name will delete it and free the memory associated with it.

Example: $> dpcb calculator

**Block PCB:** Typing “bpcb” followed by a valid and existing process name will place it in the blocked state and reinsert it into the appropriate queue.

Example: $> bpcb calculator

**Unblock PCB:** Typing “upcb” followed by a valid and existing process name will place it in the ready state and reinsert it into the appropriate queue.

Example: $> upcb calculator

**R3**

**Removed Commands:**

**Create PCB**

**Delete PCB**

**Block PCB**

**Unblock PCB**

**Dispatching Commands:**

**Loadr3:** Typing “loadr3” will load all r3 ”processes” into memory in a suspended ready state at any priority of your choosing

**Temporary Commands:**

**Yield:** Typing “yield” will cause the command handler to yield to other “processes” (i.e. voluntarily give up CPU time). If any processes are in the ready queue, they will be executed. This command will be removed after R3.

**Updated Commands:**

**Resume PCB:** The resume PCB command (“rpcb”) has a new option, “--all", that will resume all process in the suspended state, whether they are blocked or not.

**R4**

**Removed Commands**

**Yield**

**R5**

**Dispatching Commands:**

**Show Free Memory/Show Allocated Memory:** Typing “showMemory” followed by a secondary command (similar to the time commands) will show the address of the block as well as the size of the block for either free memory or allocated memory. They will be shown in order of address. The secondary commands are “all”, “free”, and “allocated”

**Temporary Commands:**

**Initialize Heap:** Typing “initHeap” followed by a number will allocate the memory available for the OS. It will take an integer parameter that will indicate the size of the heap in bytes.

**Allocate Memory:** Typing “allocMem” followed by a number will allocate memory from the heap. It will take an integer parameter indicating the amount of bytes to be allocated from the heap

**Free Memory:** Typing “freeMem” followed by a number will free a particular block of memory that was previously allocated. It will use an address or a pointer to an address in memory as its parameter and will then search the allocated list for the block

**Is Empty:** Typing “isEmpty” will return true or false based on whether the heap is empty, or put more simply, contains ONLY free memory.

**R6**

This command can have one OR two arguments., similar to the date command:

**Method I:** Typing only the name of the disk image file you want to access.

**Method II:** Typing the name of the disk image file you want to access, followed by a valid file path or file name contained in the disk image.

**Print Boot Sector Information:** Typing “pbs” will allow you to validate that your software is correctly accessing the boot sector information.

**Print Root Directory:** Typing “root” will list all the files and directories contained within the root directory.

**Change Directory:** Typing “cd” followed by a valid directory name will change your current directory. Initially your current directory will be the root directory. You will always change to a subdirectory of the current directory.

**List Directory:** Typing “list” followed by an optional valid filter name will print the entire contents of the current directory. It is similar to the “dir” command in DOS. That includes the filename, extension, logical file size, and starting logical cluster string for each file. A valid filter name filename or extension. Example \*.txt will bring up only .txt files.

**Type:** Typing “type” followed by a valid file name will print the contents of any file with the extension “TXT”, “BAT”, or “C”. The command will print the contents of the file to the screen one “screen” full at a time. Similar to “less” command in BASH

**Rename:** Typing “rename” followed by a valid current file name or directory and then followed by a valid new file or directory name will rename a file OR directory.

**Extra Credit:**

**Move:** Typing “mv” followed by a valid current directory name and then followed by a valid new directory name will move the file descriptor from one directory to another.