**User manual for MPX core OS**

Group 16

The following commands are available to choose from. Simply type in the keyword followed by any additional/required parameters, separated by spaces and then press enter.

* To display current time: gettime
  + This displays the time in HH:MM:SS format.
  + The time being displayed is in 24-hour format, rather than 12-hour AM/PM format.
* To set current time: settime [HH] [MM] [SS]
  + HH represents the new hour value. This value must be between 0 and 23.
  + MM and SS represents the new minutes and seconds values, respectively. Both values must be between 0 and 59.
  + To use this command, all three parameters following the keyword must be present.
  + Only a maximum of three parameters are allowed. Going above or below this amount would result in an error and the current time is unaffected.
* To display current date: getdate
  + This displays the date in YY/MM/DD format.
* To set current date: setdate [YY] [MM] [ DD]
  + YY represents the new year value, where the actual full year is stored as 20XX, where XX is the stored year value. This value must be between 0 and 30.
  + MM represents the new month value. This value must be between 1 and 12.
  + DD represents the new day value. This value must be between 1 and 31.
* To clear the screen: clear
  + Clears most of the screen except the initial statement welcoming the user to the main menu.
* To view command help: help
  + Prints available statements and how to properly use them.
* To exit and shutdown the OS: shutdown
  + Before shutting down, a display message will be printed, asking for confirmation to continue the shutdown process.
  + If ‘y’ is entered, the shutdown operation will continue. If ‘n’ is entered, the shutdown operation is cancelled. Any other input is ignored.
* To create a new PCB: pcb create [name] [class number] [priority number]
  + Creates a new Process Control Block based on provided inputs.
  + [name] is the PCB’s name and must be less than 20 characters long.
  + [class number] is the PCB’s class (system or application). A value of 0 indicates that the PCB is a system PCB, and a 1 indicates it as an application PCB.
  + [priority number] is the PCB’s priority. It must be a value between 0 and 9, with a larger number indicating a higher priority.
* To delete an existing PCB: pcb delete [name]
  + Removes a PCB from its queue and frees up its memory.
  + [name] is the PCB’s name to be deleted.
  + PCB’s name must be valid and a PCB with t
  + he given name must be found for proper deletion.
* To block a PCB: pcb block [name]
  + Changes the PCB’s state from ‘ready’ to ‘blocked’
  + This removes the PCB from its queue and reinserts it back into the appropriate queue.
  + [name] is the PCB’s name to be blocked
  + The name must match an existing PCB’s name for proper blocking.
* To unblock a PCB: pcb unblock [name]
  + Changes the PCB’s state from ‘blocked’ to ‘ready’
  + This removes the PCB from its queue and reinserts it back into the appropriate queue.
  + [name] is the PCB’s name to be unblocked.
  + The name must match an existing PCB’s name for proper unblocking.
  + When unblocking, the PCB will be inserted back to the appropriate ready queue based on its priority.
* To suspend a PCB: pcb suspend [name]
  + Changes the PCB’s status to be ‘suspended’
  + This removes the PCB from its queue and reinserts it back into the appropriate suspended queue.
  + [name] is the PCB’s name to be suspended.
  + The name must match an existing PCB’s name for proper suspending.
* To resume a PCB: pcb resume [name]
  + Changes the PCB’s status to be ‘not suspended’
  + This removes the PCB from its queue and reinserts it back into the appropriate not suspended queue.
  + [name] is the PCB’s name to be resumed.
  + The name must match an existing PCB’s name for proper resuming.
* To change a PCB’s priority value: pcb priority [name] [new priority value]
  + Removes a PCB from its queue and changes its priority value, then reinserts it back to its original queue.
  + [name] must be a valid name for an existing PCB.
  + [new priority value] must be number between 0 and 9, with a larger number indicating a higher priority.
* To show a single PCB: pcb show [name]
  + Shows relevant information about a PCB such as its name, class, state, status and priority value.
  + [name] must be a valid name for an existing PCB.
* To show all ‘ready’ PCBs: pcb show ready
  + Shows relevant information about all PCBs present in the ‘ready’ and ‘suspended ready’ queues.
  + If no PCB exists within a queue, the corresponding section will be empty.
* To show all ‘blocked’ PCBs: pcb show blocked
  + Shows relevant information about all PCBs present in the ‘blocked’ and ‘suspended blocked’ queues.
  + If no PCB exists within a queue, the corresponding section will be empty.
* To show all PCBs: pcb show all
  + Shows relevant information about all PCBs stored in memory and within queues.
  + If no PCB exists within a queue, the corresponding section will be empty.
* To load test processes: loadr3
  + Loads a total of five test processes in a suspended ready state.
  + When a test process is unsuspended, it will print a message indicating its successful run in the CPU.
  + A test process will perform its task more than once based on the process’ number.
  + Test processes can be completely removed from the system before their termination as long as the process is in a non-suspended state. Otherwise, the process cannot be removed prematurely.
* To create an alarm: alarm [message] [time]
  + Creates an alarm that will print a given message to the screen when a specified time is reached.
  + [message] is the message that the alarm will print to the screen.
  + [time] is the amount of time in seconds that must at least pass from the time of creating the alarm before the message can be printed. This value should a positive integer.
  + Depending on the CPU load and the number of processes preceding the alarm-checking process, it is possible for the message to be printed later than the specified time.
  + It is possible to create multiple alarms with different or similar messages which can be printed together given that the timer for each alarm had been reached.
* To check if the heap is empty (nothing is allocated in it): heap check
  + Prints a message indicating the status of the heap.
  + If the heap is completely empty, the message “heap is empty” will print.
  + If the heap is partially or completely allocated, the message “heap is NOT empty” will print.
* To show a list of allocated memory blocks in the heap: heap show allocated
  + For each block that is allocated for a process, the block’s starting address and size (in bytes) is printed.
  + Each block’s information is visually separated from subsequent blocks for easier readability.
* To show a list of free memory blocks in the heap: heap show free
  + Similar to showing a list of allocated blocks, this will print the same information for the free blocks of memory.
  + The last free block in the list is the heap (or its remainder) which is usually the largest in size.