**Technical Support Manual**

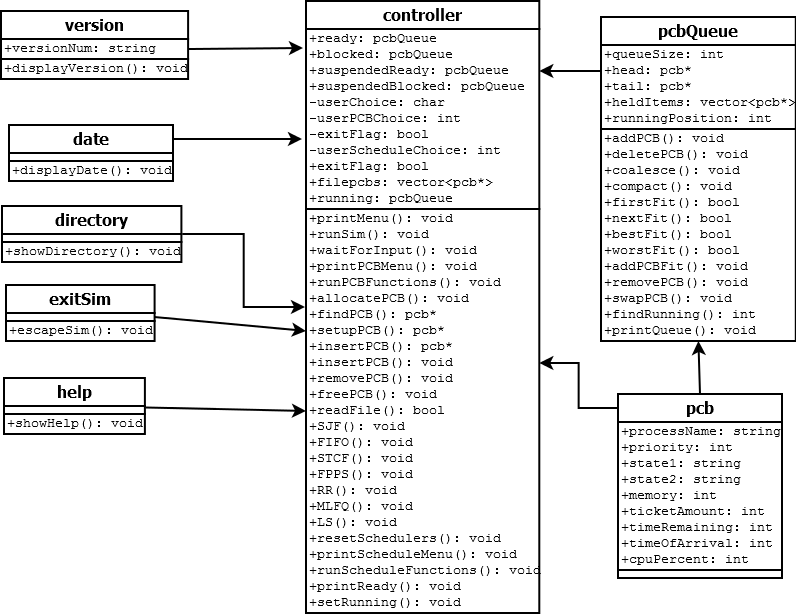
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2. Overview of Program

PotatOS is an operating system simulator created for Professor Bowe’s operating systems class. It utilizes a menu from which the user can choose the action they wish to perform. These actions all have to do with actions that an operating system can perform, such as showing the date and making/scheduling processes.

3. Program Structure



controller files:  
 controller class – controls all functions of the operating system simulator  
 printMenu – prints menu of choices for user  
 printPCBMenu – prints menu of choices relating to PCBs  
 waitForInput – waits for user input before continuing the program  
 runSim – runs the operating system simulator  
 runPCBFunctions – runs various PCB functions  
 allocatePCB – allocates memory for a new PCB  
 findPCB – searches PCB queue for PCB with same name as input  
 setupPCB – uses user input to create a new PCB  
 insertPCB – inserts PCP into appropriate queue  
 removePCB – removes PCB from queue  
 freePCB – deletes PCB and frees its memory  
 resetSchedulers – clears ready and blocked queues  
 readFile – reads in a file to create PCB’s based on its contents  
 SJF – runs a shortest job first scheduler  
 FIFO – runs a first in first out job scheduler  
 STCF – runs a shortest time to completion first job scheduler  
 FPPS - runs Fixed Priority Pre-Emptive Scheduling  
 RR – runs a round robin job scheduler  
 MLFQ – runs job scheduling using a multi-leveled feedback queue  
 LS – runs job scheduling using a lottery scheduler  
 setRunning – resets running queue to only have one empty PCB  
 chooseFit – user chooses which memory management algorithm to use  
version files:  
 version class – used to display version of OS  
 displayVersion – displays version of the operating system  
date files:  
 date class – used to display current date  
 displayDate – displays current date   
directory files:  
 directory class – used to find files in a directory  
 showFiles – displays file names of all files in OS’s directory  
help files:  
 help class – used to give user help  
 showHelp – displays help messages for each command of the OS  
exitSim files:  
 exitSim class – used to exit the OS simulator  
 escapeSim – exits the OS simulator   
pcb files:  
 pcb class – makes PCBs that are used in various parts of the program  
pcbQueue files:  
 pcbQueue class – holds PCBs using vectors  
 addPCB – adds PCB to vector  
 deletePCB – removes PCB from vector  
 coalesce – performs coalescing on the queue  
 compact – performs compaction on the queue  
 firstFit – uses First Fit management to add new PCB to queue  
 nextFit – uses Next Fit management to add new PCB to queue  
 bestFit – uses Best Fit management to add new PCB to queue  
 worstFit – uses Worst Fit management to add new PCB to queue  
 removePCB – sets all PCBs in queue to empty  
 swapPCB – moves a PCB to another queue and sets it to empty in the source queue  
 findRunning – looks for a non-empty PCB and returns its position  
 printQueue – prints the names and memory of all PCBs in queue  
 addPCBFit – adds PCB to queue using specified fit algorithm

4. Description of each function

-void printMenu() – prints menu of choices for user  
-void runSim() – runs the operating system simulator  
-void runPCBFunctions() – runs PCB functions based on user input  
-void printPCBMenu() – prints menu of choices relating to PCBs  
-void waitForInput() – waits for user input before continuing the program  
-void displayVersion() – displays version of the operating system  
-void displayDate() – displays current date   
-void showFiles() – displays file names of all files in OS’s directory  
-void showHelp() – displays help messages for each command of the OS  
-void escapeSim() – exits the OS simulator   
-void allocatePCB – allocates memory for a new PCB  
-pcb\* findPCB(string) – searches PCB queue for PCB with same name as input  
-pcb\* setupPCB(string, int, char) – uses user input to create a new PCB  
-void insertPCB(pcb\*) – inserts PCP into appropriate queue  
-void removePCB(pcb\*) – removes PCB from queue  
-void freePCB(pcb\*) – deletes PCB and frees its memory  
-void readFile() – reads file to create PCBs based on its contents  
-void SJF() – runs a shortest job first scheduler  
-void FIFO() – runs a first in first out job scheduler  
-void STCF() – runs a shortest time to completion first job scheduler  
-void FPPS() - runs Fixed Priority Pre-Emptive Scheduling  
-void RR() – runs a round robin job scheduler  
-void MLFQ() – runs job scheduling using a multi-leveled feedback queue  
-void LS() – runs job scheduling using a lottery scheduler  
-void addPCB(pcb\*) – adds PCB to vector  
-void deletePCB(pcb\*) – removes PCB from vector  
-void coalesce() – performs coalescing on the queue  
-void compact() – performs compaction on the queue  
-bool firstFit(pcb\*) – uses First Fit management to add new PCB to queue  
-bool nextFit(pcb\*) – uses Next Fit management to add new PCB to queue  
-bool bestFit(pcb\*) – uses Best Fit management to add new PCB to queue  
-bool worstFit(pcb\*) – uses Worst Fit management to add new PCB to queue  
-void removePCB(pcb\*) – sets all PCBs in queue to empty  
-void swapPCB(pcbQueue) – moves a PCB to another queue and sets it to empty in the source queue  
-int findRunning() – looks for a non-empty PCB and returns its position  
-void printQueue() – prints the names and memory of all PCBs in queue  
-void addPCBFit(pcb\*) – adds PCB to queue using specified fit algorithm

5. Description of Data Structures

-controller class - controls all functions of the operating system simulator. It includes variables that are used to indicate what actions the user wants to perform from various different menus. It also holds all of the queues that are used for scheduling purposes.   
-version class – used to display current version of OS. The string versionNum holds the version number.  
-date class – used to display current date  
-help class – used to give user help  
-directory class – used to find files in a directory  
-exitSim class – used to exit the OS simulator  
-pcb class – makes PCBs to use elsewhere in program  
-pcbQueue class – holds pcbs in a vector. It can add, delete, and performs other actions on its pcbs using functions

6. Global Variables

N/A

7. Cross References

void printMenu() – called by runSim  
void runSim() – calls printMenu, displayVersion, displayDate, showFiles, showHelp, and escapeSim, and printPCBMenu  
void displayVersion() – called by runSim  
void displayDate() – called by runSim  
void showFiles() – called by runSim   
void showHelp() – called by runSim  
void escapeSim() – called by runSim  
void insertPCB() – calls addPCB and removePCB  
void setupPCB() – calls allocatePCB  
void runPCBFuntions() – calls insertPCB, searchPCB, removePCB, and freePCB  
void runScheduleFunctions() – calls SJF, FIFO, STCF, FPPS, RR, MLFQ, LS, and resetScheduler  
void SJF() - calls readFile, addPCBFit, deletePCB, chooseFit, setRunning  
void FIFO() - calls readFile, addPCBFit, deletePCB, chooseFit, setRunning  
void STCF() - calls readFile, addPCBFit, deletePCB, chooseFit, setRunning  
void FPPS() - calls readFile, addPCBFit, deletePCB, chooseFit, setRunning  
void RR() - calls readFile, addPCB, deletePCB, chooseFit, setRunning  
void MLFQ() - calls readFile, addPCB, deletePCB  
void LS() - calls readFile, addPCB, deletePCB  
void addPCBFit() – calls firstFit, nextFit, bestFit, worstFit, coalesce, compact