

Operating Systems

CMPT 424 • Fall 2023

– iProject Four (final) - 200 points

Goals	To improve on the functionality from iProject Three (all of which is required) by adding a local file system and swapped virtual memory so you can execute more processes than you have partitions for in memory. Also, to make something of which you are proud, that you can show people, and brag about, and talk about in job interviews for years to come.	
Functional Requirements	<p>Add shell commands and implement functionality for the following disk operations, displaying a message of success or failure for each one:</p> <ul style="list-style-type: none"><input type="checkbox"/> <code>format</code> — Initialize all blocks in all sectors in all tracks [10 points]<input type="checkbox"/> <code>create <filename></code> — Create the file <i>filename</i> [10 points]<input type="checkbox"/> <code>read <filename></code> — Read and display the contents of <i>filename</i> [10 points]<input type="checkbox"/> <code>write <filename> "data"</code> — Write the data inside the quotes (but not the quotes themselves) to <i>filename</i> [10 points]<input type="checkbox"/> <code>delete <filename></code> — Remove <i>filename</i> from storage [10 points]<input type="checkbox"/> <code>copy <existing filename> <new filename></code>— copy [10 points]<input type="checkbox"/> <code>rename <current filename> <new filename></code>— rename [10 points]<input type="checkbox"/> <code>ls</code>— list the files currently stored on the disk. [10 points] <p>Challenges: See many challenges on next page. [+ points]</p>	
Implementation Requirements	<p>Implement your file system in HTML5 session storage as discussed in class, including</p> <ul style="list-style-type: none"><input type="checkbox"/> a disk system viewer in your OS interface [10 points]<input type="checkbox"/> a Disk System Device Driver (dsDD) for all of the functional requirements noted above. [10 points]<ul style="list-style-type: none">• Load the dsDD in a similar manner as the keyboard device driver.• Develop your dsDD to insulate and encapsulate the implementation of the kernel-level I/O operations (noted above) from the byte-level details of your individual blocks on the local storage. <p>Implement swapped virtual memory with enough physical memory for three concurrent user processes.</p> <ul style="list-style-type: none"><input type="checkbox"/> Allow the OS to execute four or more concurrent user process by writing roll-out and roll-in routines to . . . [100 points]<ul style="list-style-type: none">• Take a ready process and store it to the disk via your dsDD.• Load a swapped-out process from disk and put it in the ready queue.• Your ready queue should denote which processes are where.<input type="checkbox"/> Your code must separate structure from presentation, be professionally formatted, use and demonstrate best practices, and make me proud to be your teacher. [−∞ if not]<input type="checkbox"/> You must commit to Git early and often. I am not kidding. By the end of this semester you should have over 100 commits.	
Submitting	Update GitHub with your current code. Tell me what branch to grade.	

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- ❑ Add FCFS and non-preemptive priority scheduling algorithms to your CPU scheduler. (Keep RR as the default.) Include `getSchedule` and `setSchedule` shell commands.

```
>format
Format successful
>ls
No files exist
>create test
File created: test
>ls
test
>write test "this is a test"
File updated: test
>read test
this is a test
>write test "a"
File updated: test
>read test
a
>
```

[illegible]

```
>load
Process ID: 0
>load
Process ID: 1
>load
Process ID: 2
>load
Process ID: 3
>runall
>
```

Log

Sun, Aug 28th 2016, 2:17:54 pm

3040

OS

Idle

Sun, Aug 28th 2016, 2:17:36 pm

2699

OS

CPU cycle

Processes

Round Robin

PID	PC	IR	ACC	X	Y	Z	Priority	State	Location
0	13	AC	1	0	1	0	32	Ready	Memory
1	15	A2	1	1	1	0	32	Ready	Memory
2	13	AC	1	0	1	0	32	Running	Memory
3	0	0	0	0	0	0	32	Ready	Hard Drive

Memory

0x208	40	00	AC	40	00	A2	01	FF
0x210	EE	40	00	AE	40	00	EC	41
0x218	00	D0	EF	A9	44	8D	42	00
0x220	A9	4F	8D	43	00	A9	4E	8D

Hard Drive

[illegible]

CPU

LDY \$0040

PC	IR	ACC	X	Y	Z
00D	AC	1	0	1	0

```
A9 03 8D 41 00 A9
01 8D 40 00 AC 40
00 A2 01 FF EE 40
00 AE 40 00 EC 41
00 D0 EF A9 44 8D
```