

Started on Tuesday, 26 July 2022, 11:07 AM

State Finished

Completed on Tuesday, 26 July 2022, 12:22 PM

Time taken 1 hour 14 mins

Grade 50.00 out of 70.00 (71.43%)

Information

SECTION 3. File systems (15 points)

Consider a 32-bit file system with 1024 blocks on the single indirect level, and an i-node format that has 12 blocks for direct access, 1 block for single indirect access, 1 block for double indirect access. Determine the following parameters (do not enter the unit when writing your answer):

Question **1**

Correct

Mark 5.00 out of 5.00

Size of a block (in bytes):

Answer: 4096



Question **2**

Correct

Mark 5.00 out of 5.00

Number of blocks for the direct level:

Answer: 12



Question **3**

Correct

Mark 5.00 out of 5.00

Number of blocks of the second level of indirection:

Answer: ✓

Information

SECTION 4. Page replacement algorithms (20 points) (All-or-nothing questions)

Question **4**

Correct

Mark 6.00 out of 6.00

Page references: 4,5,6,7,8,9,9,8,7,6,5,4

Algorithm: FIFO

Number of Frames: 4

4	4	4	4	8	8	8	8	8	8	8	8
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	5	5	5	5	9	9	9	9	9	9	9
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		6	6	6	6	6	6	6	6	5	5
		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			7	7	7	7	7	7	7	7	4
			✓	✓	✓	✓	✓	✓	✓	✓	✓



Page references: 5,4,3,2,1,1,2,3,4

Algorithm: LRU

Number of Frames: 3



Use bit: 0 = off, 1 = on

The diagram illustrates a sequence of states in a 2D grid over four time steps. Each cell contains a number and a green checkmark. The grid is bounded by a thick black line on the left and right, and a thick black line at the bottom. The top boundary is a thin black line. The grid is composed of 4 rows and 8 columns of cells. Each cell is a square with a thin black border. The numbers are in the center of each cell. The green checkmarks are in the top-left corner of each cell. The grid is divided into four rows, each representing a time step. The first row shows the initial state with all cells containing 0. The second row shows the state after one time step, with cells containing 1. The third row shows the state after two time steps, with cells containing 2. The fourth row shows the state after three time steps, with cells containing 3. The grid is bounded by a thick black line on the left and right, and a thick black line at the bottom. The top boundary is a thin black line. The grid is composed of 4 rows and 8 columns of cells. Each cell is a square with a thin black border. The numbers are in the center of each cell. The green checkmarks are in the top-left corner of each cell.

SECTION 5. Fair-Share scheduling algorithm (10 points) (All-or-nothing question)

Question 7

Incorrect

Mark 0.00 out of 10.00

Given a system with two processes (A and B) that are members of Group 1 and Group 2 respectively, execute the Fair-Share scheduling algorithm and complete the following table.

	Group 1			Group 2		
Time	Process A			Process B		
	Priority	Process CPU Count	Group CPU Count	Priority	Process CPU Count	Group CPU Count
0	45	0	0	45	0	0
1	67	22	22	45	0	0
2	55	11	11	67	22	22

You can assume that:

1. The base priority is equal to 45.
2. The processor is interrupted 60 times per time instant (the number of counts of the process that is currently running will be increased).
3. The weight of Group 1 is equal to the weight of Group 2.
4. If the priority of the two processes is the same, you will use the lowest PID criterion (using lexicographical order).

SECTION 6. Uniprocessor scheduling algorithms (5 points each) (All-or-nothing questions)

Execute FCFS for the following group of processes and complete the following table:

Process	A	B	C	D
T _{Arrival}	0	2	4	6
T _s	3	5	4	1
T _{Finish}	<div>3</div> ✓	<div>8</div> ✓	<div>12</div> ✓	<div>13</div> ✓
T _R	<div>3</div> ✓	<div>6</div> ✓	<div>8</div> ✓	<div>7</div> ✓

If two processes or more processes arrive at the ready queue at the same time, you will use the lowest PID criterion (using lexicographical order).

Execute RR (Q=4) for the following group of processes and complete the following table:

Process	A	B	C	D
T _{Arrival}	0	2	4	6
T _s	3	5	4	1
T _{Finish}	<div>3</div> ✓	<div>12</div> ✗	<div>11</div> ✓	<div>13</div> ✗
T _R	<div>3</div> ✓	<div>10</div> ✗	<div>7</div> ✓	<div>7</div> ✗

If two processes or more processes arrive at the ready queue at the same time, you will use the lowest PID criterion (using lexicographical order).



Question **10**

Correct

Mark 5.00 out of 5.00

Execute SPN for the following group of processes and complete the following table:

Process	A	B	C	D
T_{Arrival}	0	1	5	6
T_s	4	2	3	1
T_{Finish}	<input type="text" value="4"/> ✓	<input type="text" value="6"/> ✓	<input type="text" value="10"/> ✓	<input type="text" value="7"/> ✓
T_R	<input type="text" value="4"/> ✓	<input type="text" value="5"/> ✓	<input type="text" value="5"/> ✓	<input type="text" value="1"/> ✓

If two or more processes in the ready queue have the shortest service time, you will use the lowest PID criterion (using lexicographical order).

Question **11**

Incorrect

Mark 0.00 out of 5.00

Execute SRT for the following group of processes and complete the following table:

Process	A	B	C	D
T_{Arrival}	0	1	5	6
T_s	4	2	3	1
T_{Finish}	<input type="text" value="7"/> ✗	<input type="text" value="3"/> ✓	<input type="text" value="10"/> ✓	<input type="text" value="4"/> ✗
T_R	<input type="text" value="7"/> ✗	<input type="text" value="2"/> ✓	<input type="text" value="5"/> ✓	<input type="text" value="2"/> ✗

1. If the process arriving has the same remaining execution time as the process in the CPU, then the process that is using the CPU will have the highest priority.
2. If there is no process in the execution state and two or more processes have the shortest remaining time, then you will use the lowest PID criterion (using lexicographical order).

Execute HRRN for the following group of processes and complete the following table:

Process	A	B	C	D	E
T _{Arrival}	0	2	4	6	8
T _s	2	3	5	1	4
T _{Finish}	<div>2</div> ✓	<div>5</div> ✓	<div>10</div> ✓	<div>11</div> ✓	<div>15</div> ✓
T _R	<div>2</div> ✓	<div>3</div> ✓	<div>6</div> ✓	<div>5</div> ✓	<div>7</div> ✓

If two or more processes in the ready queue have the highest response rate, you will use the lowest PID criterion (using lexicographical order).

Provide a file (JPEG, PDF, etc.) showing your work (step by step) while executing the uniprocessor scheduling algorithms.



