Operating System 2021
Quiz #6

- A system with a single processor is using the FCFS scheduling strategy. Five processes $p_1,\ldots,p_5$ have arrived in the order $p_1 \prec p_2 \prec p_3 \prec p_4 \prec p_5$. The compute times are $c_1=2, c_2=1, c_3=3, c_4=1, c_5=2$ time units. Which of the following statements are correct?
  - The correct answers are: The average waiting time is $\bar{w}=185$.
  - The processes may finish in the order $p_1 \prec p_2 \prec p_3 \prec p_4 \prec p_5$.

- For real-time systems and real-time scheduling
  - Real-time systems give priority to time critical tasks in order to meet deadlines., Hard real-time systems require that all system services have known worst-case time boundaries., The earliest-deadline-first scheduling strategy guarantees that deadlines are met if sufficient resources are available for the admitted tasks and all system functions have known worst-case time boundaries., Hard real-time systems will only admit tasks with known resource requirements and if the resources available are sufficient to complete the task in time.

- A system with a single processor is using the SPTF scheduling strategy. Five processes $p_1,\ldots,p_5$ have arrived in the order $p_1 \prec p_2 \prec p_3 \prec p_4 \prec p_5$. The compute times are $c_1=2, c_2=1, c_3=3, c_4=1, c_5=2$ time units. Which of the following statements are correct?
  - The average waiting time is $\bar{w}=135$.
  - The processes may finish in the order $p_2 \prec p_4 \prec p_1 \prec p_5 \prec p_3$.

- A system with a single processor is using the RR scheduling strategy. Five processes $p_1,\ldots,p_5$ have arrived in the order $p_1 \prec p_2 \prec p_3 \prec p_4 \prec p_5$. The compute times are $c_1=2, c_2=1, c_3=3, c_4=1, c_5=2$ time units. Which of the following statements are correct?
  - The average waiting time is $\bar{w}=205$.
  - The processes may finish in the order $p_2 \prec p_4 \prec p_1 \prec p_5 \prec p_3$.
  - The processes p_1 and p_5 will be prempted once, process p_3 will be preempted twice.

- What distinguishes a fair-share scheduler from a regular scheduler?
  - A fair-share scheduler aims at assigning resources fairly to all users of a system., A fair-share scheduler makes it difficult for users to “game the system” in order to obtain an unfair share of resources.

- What are typical goals of a scheduler?
  - Provide fairness, Minimize overhead, Minimize response time, Maximize resource usage
- Scheduling strategies are preemptive
  - Round-robin, Shortest-remaining-time-first
- A system with a single processor is using the LPTF scheduling strategy. Five processes $p_1,\ldots,p_5$ have arrived in the order $p_1 \prec p_2 \prec p_3 \prec p_4 \prec p_5$. The compute times are $c_1=2, c_2=1, c_3=3, c_4=1, c_5=2$ time units. Which of the following statements are correct?

- The average waiting time is $\bar{w}=235$.
- The processes may finish in the order $p_3 \prec p_1 \prec p_5 \prec p_2 \prec p_4$.

- For round-robin variations
  - Multilevel queue scheduling separates processes with different priorities by assigning them to different queues., Multilevel feedback queue scheduling provides different priority queues but allows processes to move between queues.