Scheduling Algorithms Review

Strategy	Description	Advantages	Disadvantages
FCFS	First Come, First Served	Simple	-Average wait time may become very high as short jobs may wait behind long jobs. -May lead to poor overlap of I/O and CPU, since CPU-bound processes will force I/O bound processes to wait for the CPU, leaving the I/O devices idle.
Round Robin	Use a time slice and preemption to alternate jobs	Fair: each job gets an equal shot at the CPU	Average waiting time can be bad.
SJF/SRJF	Shortest Job First	-Provably optimal with respect to minimizing the average waiting time -Preemptive SJF is called SRTF - shortest remaining time first	-Impossible to predict the amount of CPU time a job has left. -Long running CPU bound jobs can starve.
MLFQ	Multiple queues with different priorities. Round Robin scheduling at each level, running the jobs in highest priority queue first. Round robin time slice increases exponentially at lower priorities. Priority of jobs can be changed.	-Use past behavior to ***predict*** the future and assign job priorities; the scheme is ***adaptive***. -Approximates SJF.	Still confront the problem of fairness.
Lottery Scheduling	-Give every job some number of lottery tickets; a winning ticket is randomly picked. -Give the most to short running jobs, and fewer to long running jobs (approximating SJF). -To avoid starvation, every job gets at least one ticket.	-Avoid starvation -Can approximate SJF	Adding or deleting a job affects all jobs proportionately, independent of the number of tickets a job has.