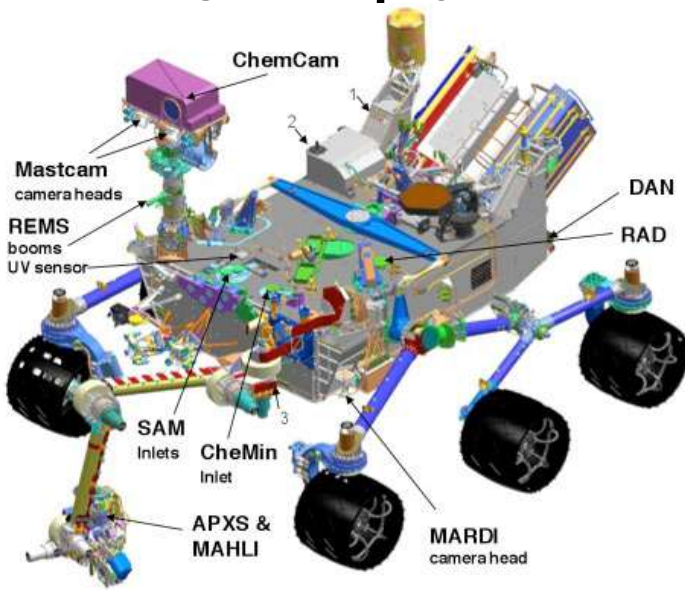


Real-Time Systems

COMP755

Real Time Programming

- Real-time computing requires that the result not only be correct, but produced within a specific time limit
- Real-time programming is used in process control to ensure that the system reacts to an input in time



Real-Time OS

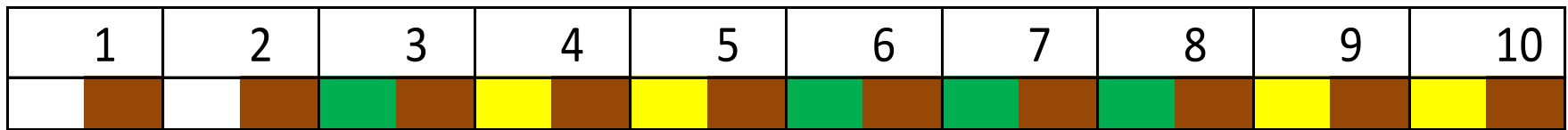
- A real-time OS provides support for ensuring tasks complete within their deadline
- Windows and Linux that you run on your laptop or web server are **NOT** real-time OS

Real Time Scheduling

- Many real time systems run a known collection of tasks. The execution time of the tasks is frequently known ahead of time.
- Tasks have deadlines by which they must complete.
- If a task that runs for 3 time units must be done at time 10, it must start by time 7.

Real-Time Schedule

- Below is a possible schedule for a R/T system with three tasks with deadlines



- 1/2 time unit once every time unit
- 2 time units once every 10 time units
- 1 time unit once every 5 time units

CPU Scheduling

The major difference between a regular OS and a R/T OS is

- CPU scheduling – There are various options for getting tasks done by deadlines
- Memory locking – A R/T task should not be paged out. This would inhibit its ability to quickly respond to input