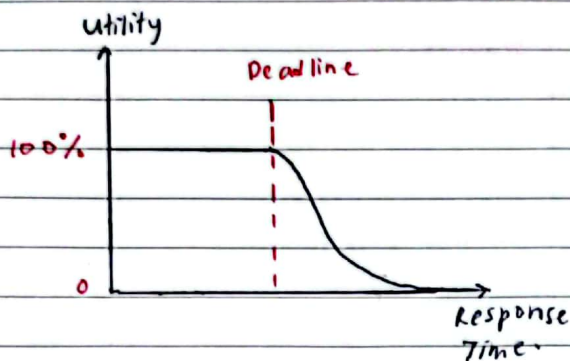


Soft Real-Time System.

- Performance degradation when it fails to meet response-time constraint.



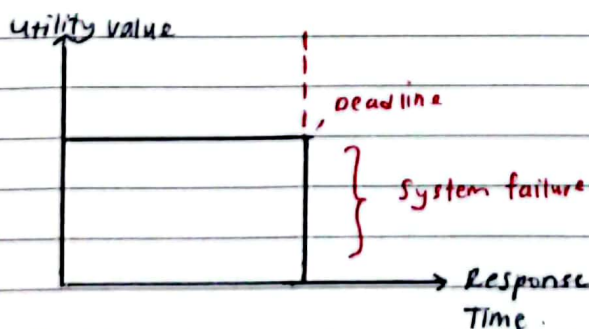
If the system miss the deadline, then its system is said to have degraded.

Example of Soft RTs :

- Web Browsing : After an URL clicked, the webpage is fetched and displayed in a couple of seconds. If it takes several minutes to fetch, we considered it as degraded performance but not a fail.

Hard Real-Time System.

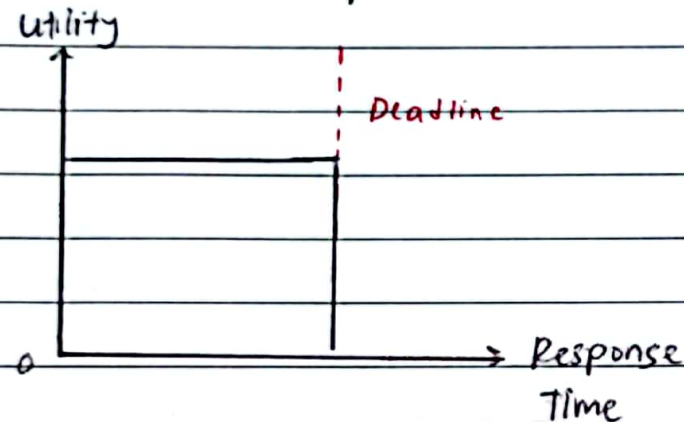
- A RTs which the failure to meet the deadline may lead to catastrophic system failure. (death, if it relates to human safety/health)
- The ~~very~~ deadlines are in the order of only micro/milliseconds.
- mostly related to health & safety critical.



- Examples :
 - Industrial Controls Application
 - Car Air Bag System
 - Automatic Fire Protection System
 - Heart Monitoring System.

Firm Real-Time System

- Missing deadline will not lead to total failure, but missing more than a few could lead to complete catastrophic system failure.



- Every Firm RTS is associated with predefined deadlines before it requires to produce its results. The predefined deadlines makes it different to Hard RTS.
- In Firm RTS, deadline miss does not meet to total fail but the results are discarded.

Example : • Video Calling Applications

- Satellite-based surveillance applications.

System	Real-Time Classification	Explanation
Avionic weapons delivery system in which pressing a button launches air-to-air missile	Hard	Missing the deadline to launch the missile within a specified time after pressing the button may cause the target to be missed, which will result in catastrophe.
Navigation controller for an autonomous weed-killer robot	Firm	Missing a few navigation deadlines causes the robot to veer out from a planned path and damage some crops.
Console hockey game	Soft	Missing even a several deadlines will only degrade performance
The Library of Congress print-manuscript database system	Soft	The database system is being used for research purpose and it limits its urgency. It seems it would be acceptable for missed deadlines to degrade the system.
A police database that provides information about stolen automobile	Soft	If the system miss the deadline to give the result, it will not result in system failure and the late result would only degrade the performance.
An Automatic Teller Machine	Soft	As long as the ATM is executing timely even though it miss deadline frequently it's output will still have value
A coin operated video game	Soft	Missing even a several deadlines will only degrade performance
A university grade-processing system	Hard	Although the system may have response times of days or even weeks, it must respond within certain time or there could be an academic or financial disaster.
Video Conferencing	Firm	When a certain frame is being played, if some preceding frame arrives at the receiver, then this frame is of no use and is discarded.
Satellite based tracking of enemy movements	Firm	When the ground computer is being overloaded, an new image may be received even before an older image is taken up for processing. In this case, the older image is of not much use.