
Tutorial 9

1. A local television programs production company (Longevity Pte. Ltd.) is planning to develop an online real time system which allows users to watch television programs online (OnlineWatch.com). The website allows users to login and watch three local television channels' programs archived for one month. You have successfully bid the project for your software organization and will kick start the project in a month time.

- a) Explain to Longevity Pte. Ltd. on the **real time system design process** for OnlineWatch.com.

1. Identify the stimuli and its response
2. For each stimuli identify the timing constraints
3. Aggregate the stimuli into concurrent process
4. Design the algorithm
5. Integrate under control real time OS system

- b) Provide 1 set of stimuli-response in the first step of the design process

1. Stimuli - advertisement interruption
Response - stop tv program and show advertisement

2. You are joining a software house that specialized in developing games. A colleague has just resigned and left the company due to personal reasons. You are assigned to take over the resigned colleague's on-going project which is to develop an **online shooting game**. The online gamers can choose to join any group to compete with another group of online gamers. The online game also allows gamers to invite their friends through social media.

Compose and explain **2 sets of stimuli** and associating response for this real time system.

1. Stimuli - user shoot the object
Response - object hit
2. Stimuli - users disconnected from server
Response - auto reconnection

3. iRobot is an automated vacuum cleaner that can automatically clean the **floor at a pre-set time**. This real time vacuum cleaner uses a **high-efficiency cleaning pattern algorithm** and a full suite of **sensors to map and adapt to real world clutter and furniture** for thorough coverage of a home. (Adapted from: <http://www.irobot.com/For-the-Home/Vacuum-Cleaning/ Roomba.aspx>).

Compose and explain **2 sets of stimuli** and associating response for the iRobot system.

1. Stimuli - obstacles e.g chair or table
Response - show cleaning and change direction
2. Stimuli - pre set time triggered
Response - start cleaning the floor

4. SmartOffice.com is a newly established company which designs and implements Internet of Things (IoT) in offices such as automation of lighting during night and in the washroom, office air-con automated temperature detection and adjustment, video monitoring system, and et cetera.

Compose 2 sets of stimuli and associating response for the automation of a lighting system.

1. Stimuli - 7pm
Response - washroom light turn on
2. Stimuli - 7am
Response - washroom light turn off

5. EPS Company is currently researching into Track Your Truck (TYT) application that offers an efficient and effective vehicle tracking system. TYT allows users to check real time location of their vehicles through Global Positioning System (GPS). Users can also view their vehicles' fuel usage, mileage, performance analysis reports through TYT. In the event of vehicle theft, a notification message will be sent to police station automatically and to the owner at the same time. In order to recover the lost vehicle the real time location can be tracked by the owner. (Source :<http://www.trackyourtruck.com/>)

Identify 1 periodic stimulus and 2 aperiodic stimulus with associating responses and timing constraints.

1 periodic stimulus

1. Every 0.5 sec update the real time location to database
- 2 aperiodic
1. Stimuli - vehicle stolen
Response - send notification to polis and owner, timing 0.1 sec
 2. Stimuli - user request performance report
Response - send performance report

Tutorial 9

6. Donao is an online theatre that provide high-definition mode movie. User can watch movie online or download the movie.

Identify 2 periodic stimulus and 2 aperiodic stimulus with associating responses and timing constraints.

2 periodic

1. Every 0.5 sec update total user watching movie online
2. Every 3 min advertisement loading at the corner of screen

2 aperiodic

1. Stimuli - play movie button press
Response - movie start playing
2. Stimuli - stop movie button press
Response - movie stop playing

7. You, as an appointed software engineer are in-charge for designing an online management system for Study Point Tutor center. Currently the tuition center has been using manual way to manage the center and now has decided to automate all their registration, classes scheduling, attendance, and payment processes.

Design 3 sets of aperiodic stimuli-response for Study Point Tutor online management system as mentioned above.

Stimuli - login user click to view classes schedule

Response - classes schedule display

Stimuli - payment successfully made

Response - send confirmation email

Stimuli - login user click to view attendance

Response - display login wizard