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.
2. Explain to Longevity Pte. Ltd. on the real time system design process for OnlineWatch.com.

**Real time design process:**

* + - Identify the stimuli that the system must process and the associated responses
    - For each stimulus and associated response, identify the timing constraints which apply to both stimulus and response processing
    - Aggregate the stimulus and response processing into a number of concurrent processes.
    - For each stimulus and response, design algorithm to carry out the required computations
    - Design a scheduling system which will ensure that processes are started in time to meet their deadlines
    - Integrate the system under the control of a real-time operating system

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

Stimuli (advertisement interruption) -> Response (stop tv program, show advertisement)

1. 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.

Stimuli (User shoot on an object) -> Response (object is hit)

Stimuli (User disconnected from the server) -> Response (auto reconnection and prepare log report)

1. 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.

Stimuli (Obstacle e.g. chair, table at home) -> Response (stop moving on, change direction)

Stimuli (Preset time for cleaning is triggered) -> Response (start cleaning the house for 3o minutes)

1. 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.

Stimuli (after 630pm) -> Response (car porch light is on)

Stimuli (after 6am) -> Response (car porch light is off)

1. 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:**

Every 0.5 seconds, send actual location of vehicle to the database

**2 aperiodic stimuli:**

Vehicle is stolen (Stimuli) – Location of the vehicle is sent to the user automatically (Response)

1. 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.

**1 periodic stimulus:**

- Every 0.5 second, update total users watching movie online

- Every 1 minute, load new advertisement at cornet screen

**2 aperiodic stimuli:**

Play movie button is pressed (Stimuli) -> (timing: 0.1 sec) Play movie online (Response)

Stop movie button is pressed (Stimuli) -> (timing: 0.1 sec) Stop movie online (Response)

1. 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.

* Logged user click view attendance button (stimuli) -> Display attendance record (Response)
* Successfully done fee payment (Stimuli) -> Confirmation email will be sent (Response)
* Non-logged user click View Class Schedule button (Stimuli) -> Prompt user to login page (Response)