Objectives

- Design a digital circuit according to given specifications.
- Familiarity with seven-segments displays.

Introduction

The goal of this project is to build a system which displays a scrolling message on the four seven-segments displays. Each character in the message enters from the right and scrolls (shifts) from right to left. The system has to continuously re-display the same message. You may display any message you like provided that it consists of at least two different English words (insert spaces as necessary between words).

Project Description

Part 1 (50 points):
Build the scrolling text system described above. The system should display your message at a speed of 1Hz. You may design the system using Verilog, schematic capture, or both. However, you have to follow a modular design approach (identify the main modules and their interfaces).

The following is a list of the main modules:
- Seven-segments Display Controller: A module to display characters on the four seven-segments displays (see the animation and sample project under resources).
- Clocks Generator: A module to generate clocks at different frequencies (see Experiment 2).
- Memory: A module to store the message to be displayed.

Part 2 (25 points):
Extend your system as follows:
- Scroll Speed: Add an input (speed) which allows to scroll the message at a speed of either 1Hz or 2Hz.
- Scroll Direction: Add an input (direction) which allows to scroll the message in either direction; i.e. right ← left or left → right.

Report (25 points)
Use the provided template to write your report. Make sure to include all the details of your project.

Discussion Questions

- None.