Inputs:

**control\_switches** - switches SW0 through SW3 on the board, While initially loading lane capacities, used to select capacity for lanes. While in Mode A or B, setting switch 0 to 1 adds car lane 0, switch 1 to 1 adds cars to lane 1, and so on. Lane 3 has priority over lane 2, lane 2 has priority over lane 1 and so forth.

**mode\_switch** - switch 17 on the board, switches between the two modes specified by the project description.

**control\_button** - key 0 on the board. Used only for initial capacity loading.

Outputs:

**HEX0** - corresponds to current amount of cars in lane 0.

**HEX1** - corresponds to current amount of cars in lane 1.

**HEX2** - corresponds to current amount of cars in lane 2.

**HEX3** - corresponds to current amount of cars in lane 3.

**HEX4** - corresponds to maximum capacity of selected lane.

**LEDR0** - when lit, machine is in Mode A

**LEDR1** - when lit, machine is in Mode B

**LEDR17** - when lit, clock is 1

**LEDR13** - when lit and in Mode B, lane 0 has a green light

**LEDR14** - when lit and in Mode B, lane 1 has a green light

**LEDR13** - when lit and in Mode B, lane 2 has a green light

**LEDR16** - when lit and in Mode B, lane 3 has a green light

**LEDG0** - when lit, loading capacity to register 0

**LEDG1** - when lit, loading capacity to register 1

**LEDG2** - when lit, loading capacity to register 2

**LEDG3** - when lit, loading capacity to register 3

**LEDG7** - when lit, loading is done, and machine can proceed to Mode A or B

Test 1:

1. Set register 0 capacity to 4 using control\_switches and confirming capacity by pressing control\_button

2. Set register 1 capacity to 3 using control\_switches confirming capacity by pressing control\_button

3. Set register 2 capacity to 2 using control\_switches confirming capacity by pressing control\_button

4. Set register 3 capacity to 1 using control\_switches confirming capacity by pressing control\_button

5. While in Mode A, fill lanes to capacity using control\_switches

6. Switch to Mode B using mode\_switch

7. Let lanes empty, noticing how if a lane reaches 0, the green light moves to the next lane that has cars

Test 2:

1. Set register 0 capacity to 10 (or A in hex), using control\_switches

2. Set register 1 capacity to 8, using control\_switches

3. Set register 2 capacity to 12 (or C in hex), using control\_switches

4. Set register 3 capacity to 5, using control\_switches

5. While in Mode A, fill lanes to any capacity using, control\_switches

6. Switch to Mode B, using mode\_switch

7. Add cars to any lane if possible, noticing how if the amount of clock cycles on a lane reaches 5, the green light moves to the next full lane, and how if a lane has a green light and user is trying to add cars to it, the lane does not increment, and the green light moves on to the next full lane after 5 clock cycles.