WENTWORTH
INSTITUTE OF TECHNOLOGY

Final Project

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Oven

- Design a circuit to control an oven
  - Turn ON/OFF → input switch
    - If oven is OFF, it will display time of the day (Starting at 00.00) State 000
    - If oven is ON, it will allow user to setup baking time and temperature
      - Default value of pre-defined temperature of this oven is 300 F State 001
      - When an oven is heating up, its temperature will increase by 2 Fahrenheit per second State 010
      - If temperature in an oven is greater than its pre-defined value, heat will be stopped. Temperature in an oven will be decreased by 0.5F/second State 011
      - After user sets its baking time and temperature, oven will start its pre-heat process.
        - When temperature reaches its pre-defined value, an LED light must be ON to show that an oven is ready and baking time will start counting down
        - After temper in an oven reaches its pre-defined value, this temperature must remain constant for at least its pre-defined time State 100

Oven

- Notes:
  - You may set some tolerant boundary for your oven
    - If the heat is applied to an oven, its temperature will increase. Once temperature inside oven reaches its upper boundary, we have to remove the heat of the oven.
    - When heat is removed from an oven, its temperature will decrease. Once it reaches the lower boundary that we could tolerate, the heat will need to apply to an oven again in order to guarantee that temperature inside oven is constant.
  - When oven is OFF, temperature inside oven will be at room temperature (65F)
  - You will need to display oven temperature when demoing

Submission

- Final Project:
  - Group of 2 people: Email me your group member ASAP
  - Due date: August 9th, 2020
  - Submission:
    - Video to demo your result (Group)
    - Code (Group)
      - Verilog file
      - Qsf file
    - Final Report (Group)
    - Self/Peer Evaluation (Individual)

Final Report

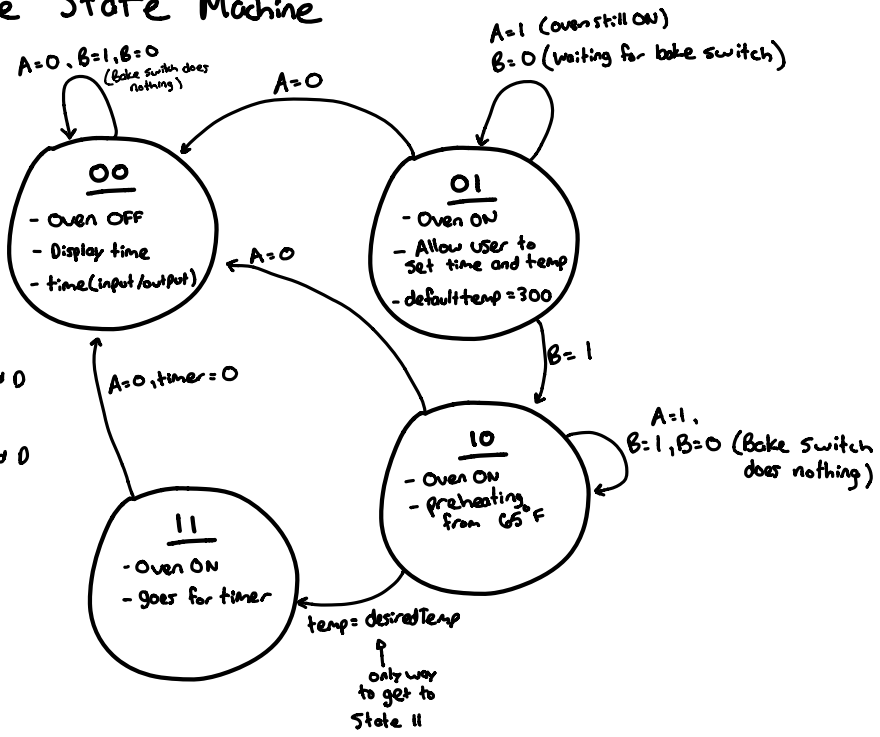
- Abstract:
  - Briefly summary of your project
- Solution:
  - Describe your solution (with block diagram)
  - Screenshot of your code along with algorithm description
- Discussion:
  - Result:
    - Did you achieve your goal?
    - Problems that you face during this project and what you did to overcome it
    - Suggestion/Future work (If any)

Self/Peer Evaluation (Individual)

- Evaluation:
  - Discuss your contribution and your team's contribution (individually) to this project
    - Rate performance of each member (score out of 10; 10 is excellent)
    - Discuss your work and their works (individually)
  - Discuss any challenges that you faced during this project and what did you do to overcome it.
  - What would you do to improve your team performance in the future?

Oven

Finite State Machine



inputs:

A - ON/OFF Switch
1/0

B - Bake Switch

C - up button

D - down button

- if in state 00, C and D change the time
- if in state 01, C and D change temp

Modules

- 7 Segment
- Time
  - → Should allow user to manually change time like a real oven
- FSM is in main file/module
  - → Module for temp change
    - └ input is either 1 or 0 for up or down and also the current temp output is new temp
      Only increments temp by one value (+ or -) but will be called very often