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CS 487
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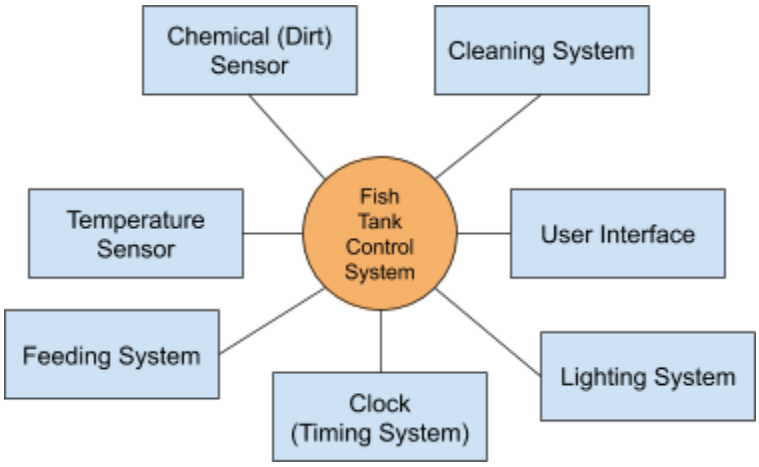
Homework 3

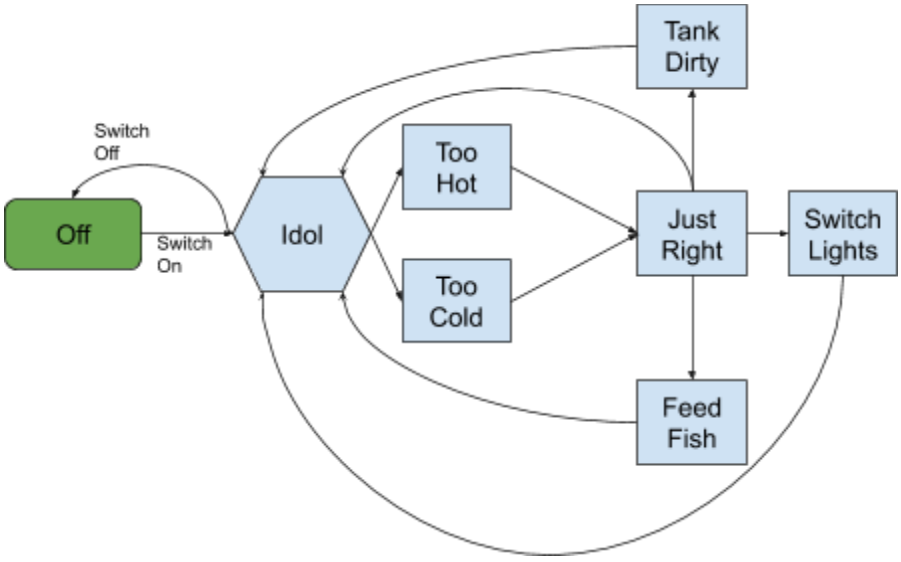
Consider a fish tank's control system which:

- **Keeps the water within a user-set temperature range**
- **Monitors the cleanliness of the water and initiates cleaning when necessary**
- **Feeds the fish and turns the lights on/off according to user-set schedules**
- **Interfaces with sensors and systems as needed**

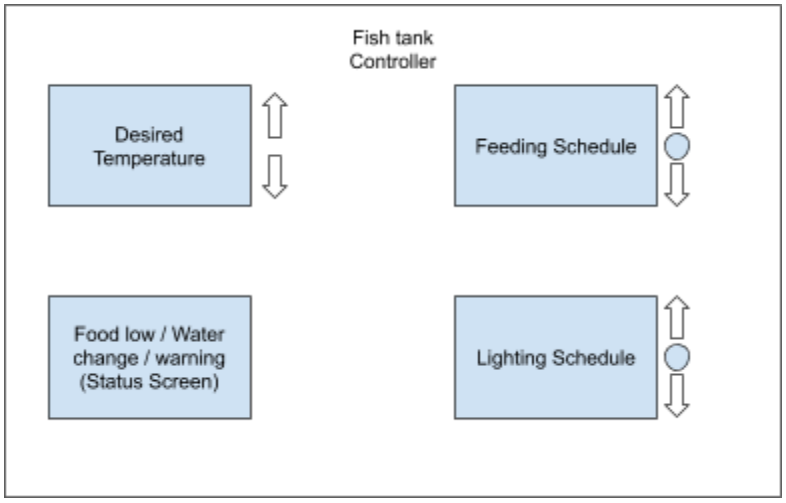
1. Draw a context model



2.Draw a state-transition diagram



3.Depict a user interface / control panel



4.Write pseudo-code to support your design

```
while(True):
    if(on & on_pressed):
        shutdown()
    else:
        clock_time.set()
        if(tank_full):
            if(not good_Temperature):  adjust_Temp(desired_temp)
            if(lights_scheduled_off): lights.off()
            else if(lights_scheduled_on): lights.on()
            if(tank_is_dirty()): tank.clean()
            if(feeding_scheduled): feed_fish()
        else: raise Fill_Tank_Error
```

5.Write a set of test cases to verify proper operation

- Turn system on/off
- Test clock system
- Adjust temperature to max limit
- Adjust temperature to min limit
- Try system with no water in tank
- Test lighting system in arbitrarily chosen schedule
- Test feeding system in arbitrarily chosen schedule
- Test scheduled feeding/lights while tank is being cleaned
- Test feeding/lights and feeding/lights/cleaning at the same time