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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**

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**2.Draw a state-transition diagram**

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**3.Depict a user interface / control panel**

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**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