

# Fish Temperature Controller

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A sample control system with  
test



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## Description

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- The Fish Temperature Controller (FTC) shall control the temperature of an aquarium
- The FTC can read the temperature of the aquarium as an integer representing the Celsius temperature
- The FTC can command an aquarium heater on and off

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## Requirements

- It must be possible to set the FTC target temperature
- When the current temperature of the aquarium is higher than the target temperature the heater is set OFF, otherwise the heater is set ON.

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## Visual interface

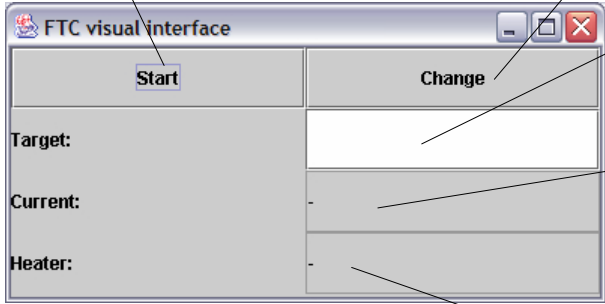
Starts the controller

Change target temperature

Here you can enter the target temperature

Shows the aquarium current temperature

Shows the heater status



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## Visual interface usage

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- Start the interface
  - ♦ `java -jar FTC.jar`
  - ♦ NB: make sure `aquarium.AquariumStubSystem` is in the classpath
- Enter the target temperature
- Set the target temperature by clicking on the Change button
- Start the controller's operations by clicking on the Start button

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## Fake Stub System

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```
package aquarium;
import controller.AquariumInterface;

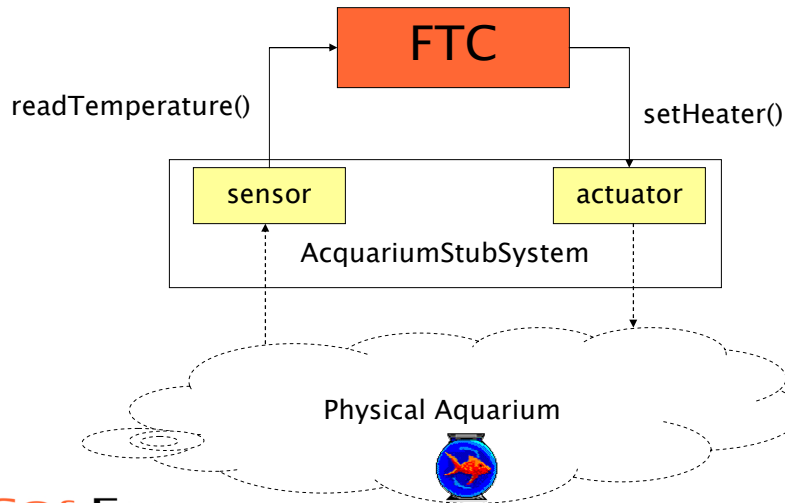
public class AquariumStubSystem
    implements AquariumInterface {
    public int readTemperature() {
        return 0;
    }

    public void setHeater(boolean on) {
    }
}
```

See `FTC_base.zip`



# System



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# Physical system simulation

```
public class AquariumStubSystem
implements AquariumInterface, Runnable {
    double temperature = 20;
    boolean heater = false;
    public AquariumStubSystem(){
        (new Thread(this)).start();
    }
    public void run(){
        try { while(true){
            if(heater) temperature+=0.2;
            if(!heater) temperature-=0.1;
            Thread.sleep(1000);
        } } catch (InterruptedException e) { }
    }
    public int readTemperature(){return (int)temperature;}
    public void setHeater(boolean on) { heater = on; }
}
```

See FTC\_physical.zip



## Scenario

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- Initial conditions
  - ♦ Aquarium temperature: 20
  - ♦ Heater: OFF
  - ♦ Target temperature: 28
- Start FTC
- Assert:
  - ♦ Heater: ON
  - ♦ Temperature is rising

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## Test-case

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- Start GUI
- Insert target temp
- Set up initial values
- Start controller
- Check heater is ON
- Check temperature is rising
  - ♦ At least 1° in 20 seconds (e.g.)



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