This the implementation assignment of the HTI course.

Assignment: (Mobile) Room Thermostat

- In the assignment we are going to *design*, *develop*, *test*, and *evaluate* a graphical (*android-based*) user-interface for a (room) thermostat.
  It is a prototype for a mobile device.
  It is *not* a prototype for a "box on the wall"!
- The basic idea is:
  - You use the mobile thermostat to define a week program and to control the heating system (wireless connection).
  - You can save the program on the device and send it to the heating system and also retrieve the program from the heating system.
  - You can monitor the status and temperature and override it temporarily (this command is "sent" to the heating system).
  - You can override the temperature permanently (also "sent" to heating) for a "vacation" setting.

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Note that we are NOT going to simulate the box on the wall of the living room. We are allowed to make use of multiple windows.

Also not that more than one thermostat could be controlling the heating system. So when you start the thermostat it is a good idea to retrieve the latest program from the heating system (server).

Assignment: Room Thermostat (cont.)

- **The thermostat interface must have the following *capabilities* and *limitations*:**
  - **There are (exactly) two temperatures, called *day* and *night*, which the user can set (to arbitrary values in the range of 5 to 30 degrees centigrade, accurate up to 0.1 degrees). These two temperatures apply to all days of the week at once.**
  - **There is one week-program. Each day may have different times for switching between day and night temperature. The week-program should be "easy to specify and to review and update".**
  - **Each day may have up to five (5) changes from day to night and five changes from night to day. Midnight is always an extra (not counted) switch to the night temperature unless this is the start of a day period. This number (5 + 5) is fixed (and it is 5 + 5, not 10). Unused switches cannot be transferred to another day.**

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Note that the capabilities are also limitations. You are not allowed to say, "look our thermostat is better because it can go up to 40 degrees and has an unlimited number of temperature changes per day".

Note that the computer is not the limitation for the 5+5 number of switches. But it is a matter of what we consider a normal user can handle, and having this limit allows interesting choices in interface design.

Assignment: Room Thermostat (cont.)

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- It must be *easy* to override the current temperature temporarily, until the next programmed switch (or midnight). The temperature can be controlled by increments and decrements of 0.1 degrees.
- It must be *easy* to override the current temperature "permanently", that is until the user switches back to the week program. (This is mainly used to go on vacation.)
- We implement a “real” communication between mobile and heating system. “send” and “retrieve” use HTTP.
- You do not implement a heating system. The heating system will be set up as a Web server for you to use.
- The thermostat is intended for "normal" people, who are smart enough to use the timer on a VCR or microwave, to send and read email, but who are not computer specialists.

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This temporary and permanent override is a good example of something for which you must provide an interface element, but the “effect” or “back end” functionality comes from the server so you send the command to the server and must periodically check for the effect.

You can use a clock that may be based on the server’s clock and that runs 300 times faster than real time: every second of real time 5 minutes of simulated time elapse. In this way we can test the thermostat.

Assignment: Room Thermostat (cont.)

- **Required actions and documents:**
  - You must hold (and report on) a brainstorming session.
  - You must create a Java Android prototype or an HTML5 prototype. (It must be "functional": you must be able to enter a week program, to review it and change it, override the temperature temporarily or permanently and go back to the program.)
  - You must create and upload a single ZIP archive containing
    - a brainstorming report (Word or pdf)
    - source and binary code for the Android prototype
    - a readme with simple installation instructions
    - basic documentation on how to use the thermostat
  - We will (later) set up appointments for evaluation experiments for which you need to then bring a mobile with the functioning prototype; evaluations experiments will be done with three groups at a time

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Note that ZIP is identified as ZIP. RAR is not ZIP for instance.

Assignment: Room Thermostat (cont.)

- **Delivery and Evaluation**
  - deadline: June 22, 11:55pm
  - format: one ZIP file (not RAR, not tar.gz, gzip, bzip, …)
  - place: upload on the Sakai site (no other way is allowed)
    Note: the upload site will shut down right after the deadline!
    only one upload per group (not one per student)
  - Our secretary will set up a meeting for evaluating your prototype. These meetings will be between June 23 and July 4.
  - Three groups will work together during the evaluation of your assignment: one will carry out a thinking aloud experiment, while a the other groups observe that experiment. (You must be present to offer help in case the experiment with your thermostat goes terribly wrong.)
    The experiments will use the real device, so make sure you bring your tablet or phone for the experiments!

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Note that the Sakai site will automatically start refusing uploads at the deadline, so it is strictly enforced!

You can submit early and then resubmit, as often as you want, right up to the deadline.

Please make sure you download your upload and make a screendump of the Sakai page showing your submission.