SOEN331: Introduction to Formal Methods for Software Engineering
Assignment on Extended Finite State Machines

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1 EFSM of the System

The EFSM of the system is the tuple $S = (Q, \Sigma_1, \Sigma_2, q_0, V, \Lambda)$, where

Q = {idle, configuration, monitoring, heating up, exit}

Σ_1 = {start monitoring, configuring, after(2 minutes), after(3 minutes), interrupt heating, completion of user entries, cancelling, inactive(1 minute), shut off}

Σ_2 = {turn furnace on, turn furnace off, turn fan on, turn fan off, click sound, beep sound, switch led light on, switch led light off, beep sound, double beep sound, prolonged beep sound, set or override triplets}

q_0 : idle

V : desiredTemp, currentRoomTemp, furnaceTemp

Λ : Transition specifications

1. $\rightarrow$ idle
2. idle $\xrightarrow{\text{configuring / (beep sound; switch led light on)}}$ configuration
3. configuration $\xrightarrow{\text{set or override triplets}}$ configuration
4. configuration $\xrightarrow{\text{cancelling / (prolonged beep sound; switch led light off)}}$ idle
5. configuration $\xrightarrow{\text{completion of user entries / (double beep sound; switch led light off)}}$ idle

6. configuration $\xrightarrow{\text{inactive(1 minute) / switch led light off}}$ idle

7. idle $\xrightarrow{\text{start monitoring}}$ monitoring

8. monitoring $\xrightarrow{\text{after(2 minutes) [currentRoomTemp} \geqslant \text{desiredTemp]}}$ monitoring

9. monitoring $\xrightarrow{\text{after(2 minutes)[currentRoomTemp < desiredTemp - 1] / turn furnace on}}$ heating up

10. heating up $\xrightarrow{\text{after(3 minutes)[furnaceTemp < desiredTemp + 1]}}$ heating up

11. heating up $\xrightarrow{\text{after(3 minutes)[furnaceTemp >= desiredTemp + 1] / (click sound; turn fan on; turn furnace off)}}$ idle

12. heating up $\xrightarrow{\text{interrupt heating / turn furnace off}}$ configuration

13. idle $\xrightarrow{\text{shut off / (turn fan off; turn furnace off)}}$ exit

2 UML State Diagram

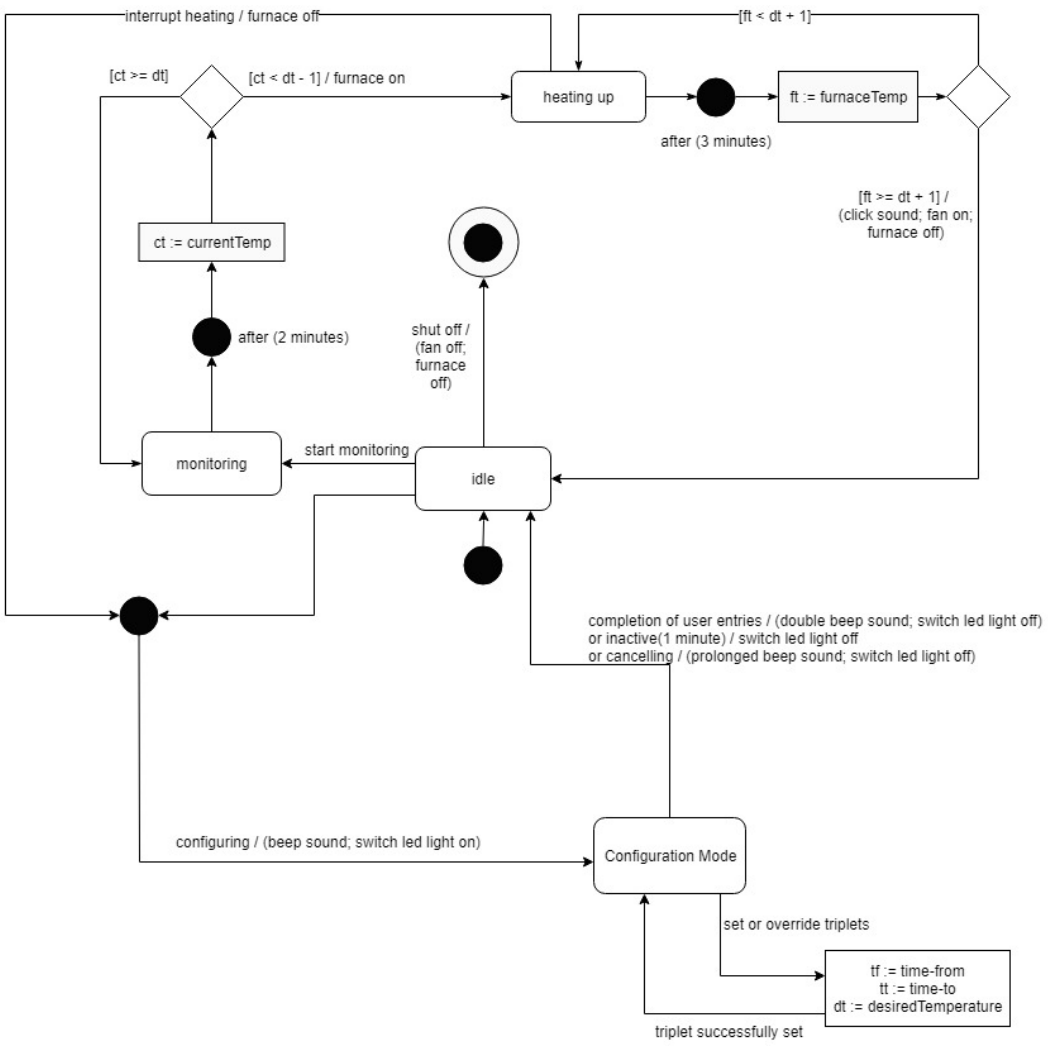

Figure 1: UML of the system