The aim of this workshop is to learn how to build simple schemas for an alarm clock.

You may assume that we already have the following types defined:

$\text{TIME}$ – this is a set of time values

$\text{BOOL}$ – this is a set containing the boolean values True and False

1. Define the state schema $\text{AlarmClock}$ that can keep track of the current time, the alarm clock time, and whether the alarm is set (i.e., alarm is turned on). The schema should also store $\text{ringing}$ which should be on (i.e., True) when the alarm goes off. You may define a default time (e.g., mid-night) as the initial current and alarm clock time.

2. Define a schema $\text{ResetAlarmClock}$ which resets $\text{AlarmClock}$ to its default value.

3. Given an input time, define a schema $\text{ChangeTime}$ for changing the current time to that input time.

4. Given an input time, define a schema $\text{ChangeAlarm}$ for changing the alarm clock time to the input time.

5. Write a schema $\text{ToggleAlarm}$ which toggles the alarm setting.

6. Write a schema $\text{ReportTime}$ that reports the current time.

7. Write a schema $\text{ReportAlarm}$ that reports the alarm clock time.

8. Write a schema $\text{Tick}$ which increments the current time. If the alarm clock time is reached and if the alarm is set to on, then ringing tone should be on. Clearly we need a refined notion of time. You may assume that there is a function $\text{inc}$ for incrementing time values and a function $a \text{ soonAfter } b$ which returns true if time $a$ is soon after time $b$. 
