



Midterm 1

1

You are working for a firm which is developing a state-of-the-art alarm clock, integrated with speech technology, which speaks the hour rather than ring. You are requested to localize the clock for the Israeli market, by defining an XFST grammar for time expressions in Hebrew. The grammar should map time expressions of the form HH:MM to their Hebrew realization along the examples in the following table.¹

3:00	elwe bdiwq	3:20	elwe wyerim
3:01	elwe w dqh axt	3:21	elwe yerim waxt
3:02	elwe weti dqwt	3:22	elwe yerim wetim
3:03	elwe welwe dqwt	...	
...		3:30	elwe welweim
3:09	elwe wtey dqwt	3:31	elwe elweim waxt
3:10	elwe wyerh	...	
3:11	elwe waxt yerh dqwt	3:58	elwe xmeim wemwnh
3:12	elwe wetim yerh dqwt	3:59	elwe xmeim wtey
...			

Submit an XFST script called `time` which, when executed, leaves on top of the stack a network which maps numerical time expressions (upper) to Hebrew (lower).

2

An improved model of the clock will round the time up to the nearest five minutes. Implement a simplified “rounding” mechanism for the grammar. The times HH:28, HH:29, HH:30, HH:31 and HH:32 should all map to the expression ‘wxci’.

Submit an XFST script called `round` which, when executed, leaves on top of the stack a network which maps numerical time expressions (upper) to Hebrew (lower).

¹Use the following transliteration of Hebrew:

a b g d h w z x v i k l m n s y p c q r e t
 א ב ג ד ה ו ז ח ט י כ ל מ נ ס ע פ צ ק ר ש ת



3

Let R be a regular relation. Define L to be the language:

$$L = \{x \cdot y \mid \langle x, y \rangle \in R\}$$

Is L a regular language? If it is, provide an XFST expression which defines it; if it isn't, prove.

Submit a text file called `L.txt` with your answer.

Submission instructions

Create a directory with your student ID as its name. Move the three files `time`, `round` and `L.txt` to the directory.