

CS112, Fall 2016  
Brandeis University

Problem Set #4: Temporal Logic: LTL and CTL  
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**Posted:** Tuesday, September 27, 2016

**Due Date:** Tuesday, October 4, 2016 at 11:59 pm

- (1) Express the following sentences in LTL:
  - (a) Every green light will be followed by a yellow light, which will be followed by a red light, which will be followed by a green light.
  - (b) Whenever the event  $\phi$  occurs in the future, it will not hold at the next moment, but will occur again later in the future.
  - (c) A train may not enter the tunnel unless the light on the other end of the tunnel is red.
  - (d) A train may only enter the tunnel after the light on the other end of the tunnel has turned red.
  - (e) Whenever a train enters the tunnel, the light on the other end of the tunnel must be red and will stay red until the train has left the tunnel.
  - (f) The event  $\phi$  may occur not more than twice in the future, at least two time units apart.
- (2) Huth and Ryan Problem 3.4 #8. (a)-(c) (page 249)
- (3) Huth and Ryan Problem 3.4 #9. (page 249)
- (4) Huth and Ryan Problem 3.4 #10. (a)-(e) (page 249)