

# Temporal Logic Handout

CSCE 420

October 17 2019

## 1 Which of the following are legal $WFF$ of TL:

- $pU(q \wedge \diamond r)$ :
- $p \diamond q$ :
- $(Ur)$ :
- $(f \wedge \bigcirc g)U \diamond \square \neg h$ :
- $\bigcirc july \wedge august(\diamond september)$ :
- $may \vee \bigcirc((april W may))$ :

## 2 Syntax

- “If a message is sent ( $send\_message$ ) to a receiver, then the message will eventually be received ( $receive\_message$ )”:
- “It is always the case that, if either ‘ $have\_passport$ ’ or ‘ $have\_ticket$ ’ is  $false$ , then , in the next moment of time ‘ $board\_flight$ ’ will also be  $false$ ”:
- “If someone is  $born$  , then it is  $living$  up until the point in time that it becomes  $dead$ ”:
- “In the next moment in time, ‘ $running$ ’ will be true and, at some time after that, ‘ $terminated$ ’ will be true.”:
- “There is a moment in the future where either  $pink$  is always true, or  $brown$  is true in the next moment in time”:
- “In the second moment in time, ‘ $hot$ ’ will be true.”:
- “When I  $start\_lecture$  it implies that I have to  $talk$  up until the time to  $end\_lecture$ ”:

- “If counter is *less\_than\_7* keep *increasing* until it is *more\_than\_7*”:
- “*wet* is equivalent to not *dry*”:

### 3 Are both the expressions same or different?

- $\diamond(\Box wumpus\_moves)$
- $\Box(\diamond wumpus\_moves)$