

Homework: $\phi = \mathbf{F}(\neg a \wedge \mathbf{X}(\neg b \mathbf{U} a))$

step	0	1	2	3	4	5	6	ω
a	0	0	0	0	1	1	1	1
b	0	1	0	0	0	1	1	1
$\neg a$								
$\neg b$								
$\neg b \mathbf{U} a$								
$\mathbf{X}(\neg b \mathbf{U} a)$								
$\neg a \wedge \mathbf{X}(\neg b \mathbf{U} a)$								
ϕ								

LTL Identities

- $\mathbf{G}\phi = \phi \wedge \mathbf{XG}\phi$
- $\mathbf{F}\phi = \phi \vee \mathbf{XF}\phi$
- $\phi \mathbf{U} \psi = \psi \vee (\phi \wedge \mathbf{X}(\phi \mathbf{U} \psi))$
- $\phi \mathbf{R} \psi = \psi \wedge (\phi \vee \mathbf{X}(\phi \mathbf{R} \psi))$
- $\phi \mathbf{R} \psi = \neg(\neg\phi \mathbf{U} \neg\psi)$
- $\mathbf{G}\phi = \neg\mathbf{F}\neg\phi$
- $\mathbf{F}\phi = \neg\mathbf{G}\neg\phi$
- $\mathbf{F}\phi = \text{True} \mathbf{U} \phi$

- **Homework**
 - rewrite $\mathbf{G}(r \rightarrow \mathbf{F}g)$ only using Release.
 - rewrite $\mathbf{F}(r \rightarrow \mathbf{G}g)$ only using Until.

Homework: $\phi = \mathbf{GF}p$

- Translate $\mathbf{GF}p$ to Generalized Buchi Automaton