

LTL & CTL fragments of CTL*

- In LTL path operator appears only once, and only in beginning.

Syntax of LTL is $A\alpha$, where α is a path formula:

$$\phi = A\alpha$$

$$\alpha = T | F | p | \neg\alpha | \alpha_1 \wedge \alpha_2 | X\alpha | F\alpha | G\alpha | \alpha_1 \cup \alpha_2$$

(The only state-formula of LTL is $A\alpha$, where α is path formula)

- In CTL a path operator must appear between two temporal ones.

State formula of CTL = state-formula of CTL*

path formula of CTL, $\alpha = X\phi | F\phi | G\phi | \phi_1 \cup \phi_2$

(temporal operators are applied only to state-formulae)

Examples

- It is impossible to have "started" and "not-ready" true:

$$AG \neg (\text{started} \wedge \neg \text{ready})$$

- A request is always eventually acknowledged:

$$AG (\text{request} \rightarrow F \text{acknowledge})$$

- p holds infinitely often on all paths:

$$AG F p.$$

- Eventually system will permanently deadlock:

$$AFG \text{deadlock}$$