

Embedded Systems

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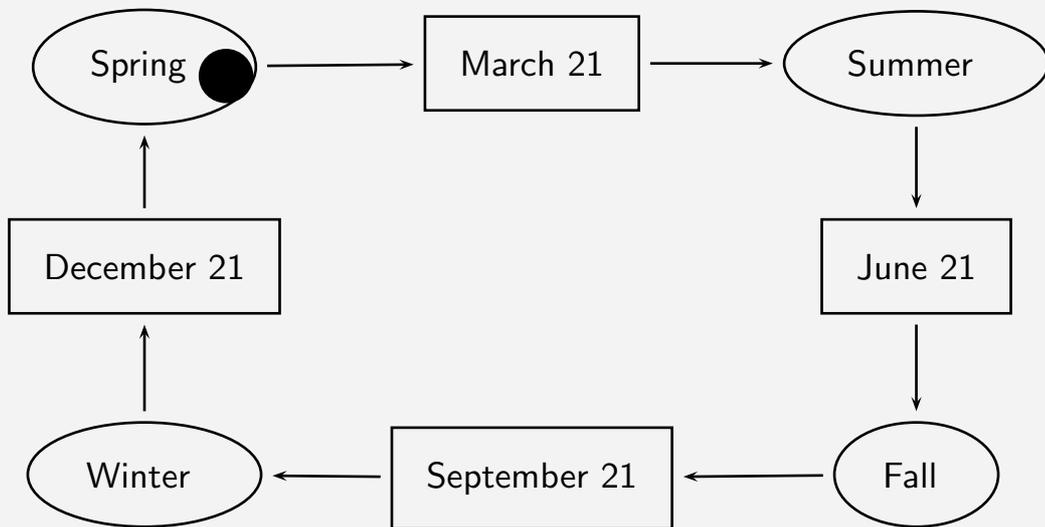
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Petri Nets

- Introduced by [Carl Adam Petri, 1962]
- **Conditions** are either met or not met
- **Events** may happen when certain conditions are met
- **Flow relation** relates conditions and events
- **Tokens** are placed in the conditions that are met

Four seasons



Nets

A **net** is a tuple

$$(C, E, F)$$

where:

- C is a nonempty finite set of **conditions**
- E is a nonempty finite set of **events**
- $C \cap E = \emptyset$
- $F \subseteq (C \times E) \cup (E \times C)$ is a **flow relation**

Definitions

Let $N = (C, E, F)$ be a net.

Let $e \in E$. Then:

$$\begin{aligned} \bullet e &= \{c \in C \mid (c, e) \in F\} && \text{(preconditions of } e\text{)} \\ e^\bullet &= \{c \in C \mid (e, c) \in F\} && \text{(postconditions of } e\text{)} \end{aligned}$$

Let $(c, e) \in C \times E$. (c, e) is a **loop** if $(c, e) \in F$ and $(e, c) \in F$
 N is **pure** if it does not contain any loops

N is **simple** if for no distinct events e_1, e_2 we have $\bullet e_1 = \bullet e_2 \wedge e_1^\bullet = e_2^\bullet$