

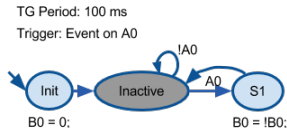
CS122A: Intermediate Embedded and Real Time Operating Systems

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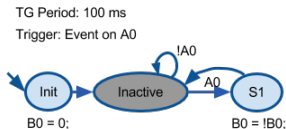
Triggered SynchSMs

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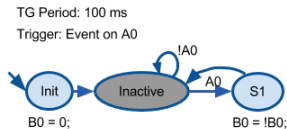
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- ▶ Some SMs are simply **polling** input for a change.
- ▶ Microcontrollers frequently come with special hardware to detect change on the input and call a *inputChangeISR*



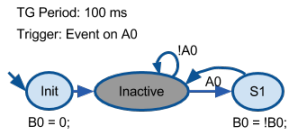
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- ▶ Adding an *inactive* allows us to create **triggered SM**



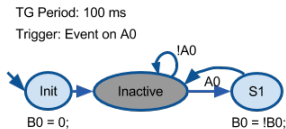
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- ▶ Adding an *inactive* allows us to create **triggered SM**
- ▶ *Inactive* states do not tick



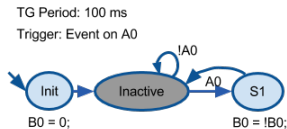
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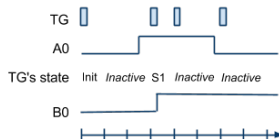
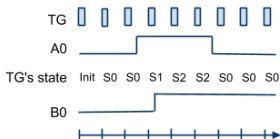
Triggered SynchSMs

- ▶ Adding an *inactive* allows us to create **triggered SM**
- ▶ *Inactive* states do not tick
- ▶ They become active when a triggering event occurs
- ▶ These tasks are **aperiodic**



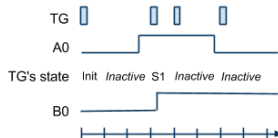
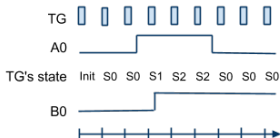
Triggered SynchSMs

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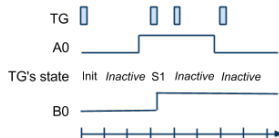
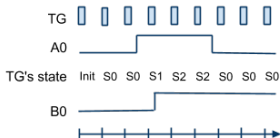
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- ▶ Reducing polling can
 - ▶ reduce utilization



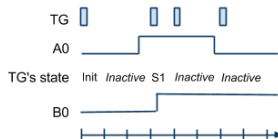
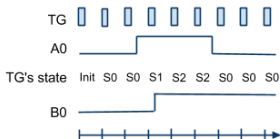
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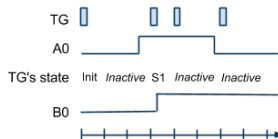
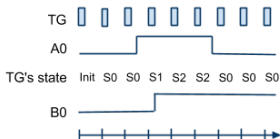
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 - ▶ reduce utilization
 - ▶ decrease jitter
 - ▶ reduce missed deadlines and
 - ▶ enable more tasks to be implemented



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- ▶ Create an SM (pollingSM) that polls the input
- ▶ Have pollingSM set a flag when there is a change on the input
- ▶ Use that flag to transition the other SM in and out of the inactive state
- ▶ **Note:** This method does reduce polling or increase sampling rate, but may lead to more intuitive synch SM's and/or better utilization