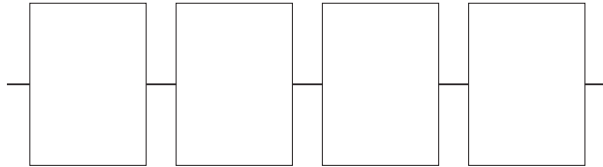


PROGRAMMING A WASHING MACHINE CYCLE

- Arrange the cards in order onto a blank sheet of paper and leave a small gap between the cards and join them with a straight line like this:

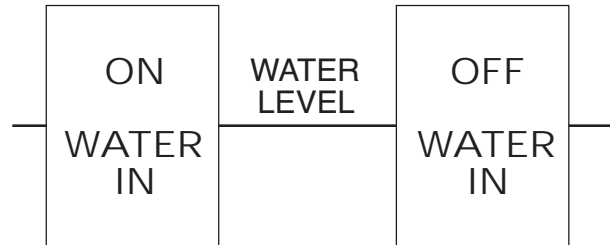


You now have a diagram of the washing machine control system showing the sequence of the actions.

Each action in the sequence is started by something:

- Sometimes, **one action starts when the one before it is complete**. For example, at the start the machine only starts to fill up once the door lock is on.
- At other times, **an action happens when a certain amount of time has gone by**. For example, the drum rotation carries on for a fixed time and then stops.
- In some cases, **an action happens when a sensor starts it off**. For example, the water filling the machine is switched off when the water reaches the correct level.

On your diagram, write next to each action the thing that makes it start. Here is an example:



- List the actions controlled by feedback
- List the actions not controlled by feedback

You can make complex diagrams easier to follow by using colour. Use this colour code on your diagram :

WATER IN	blue
HEATING	red
WATER OUT	brown
ROTATING	green.

Choose one of the parts of the system controlled by feedback.

- Draw a control system block diagram of this part of the system:

Label the input stage.
Label the process.
Label the output.

- After labelling the block diagram, write down what information is flowing between each stage.

ON	WATER IN (wash)	OFF	WATER IN (wash)	ON	WATER IN first rinse	OFF	WATER IN first rinse	ON	WATER IN final rinse	OFF	WATER IN final rinse	ON	WATER OUT wash	OFF	WATER OUT wash	ON	WATER OUT rinse
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OFF	WATER OUT rinse	ON	WATER OUT final rinse	ON	HEATER	OFF	HEATER	ON	ROTATION wash	OFF	ROTATION wash	ON	ROTATION rinse	ON	ROTATION rinse	OFF	ROTATION rinse
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ON	ROTATION final rinse	OFF	ROTATION final rinse	ON	SLOW SPIN rinse	OFF	SLOW SPIN rinse	ON	SLOW SPIN final rinse	OFF	SLOW SPIN final rinse	ON	FAST SPIN	OFF	FAST SPIN	ON	DOOR LOCK
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OFF	DOOR LOCK	ON		OFF		OFF		ON		OFF		ON	CONDITIONER RELEASED	ON		OFF	
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ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON
WATER IN	WATER IN	WATER IN	WATER IN	WATER IN	WATER IN	WATER IN	WATER IN	WATER OUT

OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
WATER OUT	HEATER	HEATER	ROTATION	ROTATION	ROTATION	ROTATION	ROTATION	ROTATION

ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON
SLOW SPIN	SLOW SPIN	SLOW SPIN	SLOW SPIN	FAST SPIN	FAST SPIN	DOOR LOCK	DOOR LOCK	ON

OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
			POWDER RELEASED	CONDITIONER RELEASED	WATER OUT	WATER OUT		