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Washing Machine

Finite State Machine

Annadata, Yagna Srinivasa Harsha

Yxa210024

Duvvuri, Sai Pravallika

Psd220003

Thota, Sai Abhishek

Sxt210056

**Description:**

As Finite State Machines are used to create many real-life appliances, as a part of it we have implemented the design of the washing machine which used 6 finite states. The 6 finite states are as follows

* Closing the door:
  + Washing machine starts when the door is closed and locked.
* Filling the water:
  + Washing machine is filled with water which is used for soaking the clothes.
* Adding detergent/soap:
  + Washing machine uses detergent/soap to clean and wash the clothes.
* Cycle for wash:
  + Cycle for wash is used by the washing machine to wash the clothes for certain time.
* Draining:
  + Wet clothes will be drained after washing and cleaning them.
* Spinning:
  + Spinning is used for drying the wet clothes.

There are 9 inputs and 7 outputs in this finite state design. The machine uses 12 flipflops, which are 3 SR, 3 JK, 3 T and 3 D. It also contains about 6 stage parameters. To toggle between the states, we have used switch case scenarios. There are additional 2-bit registers which are current and next states which are used in the code.

**Block Diagram:**

Cycle is done. Machine is off

Water is drained and clothes must dry

Clothes are dried

For drying the clothes

Cycle is not done, and machine is on

Clothes are not drained

Filling water for wet clothes

Water filled and wet clothes

Machine starts and door is closed

Detergent/ soap is added

Water is filled but clothes are not soaked

Detergent/soap is not added

Water is not filled

Machine did not start, and door is open

Spinning

Draining

Cycle for wash

Adding the Detergent/ Soap

Filling the water

Closing the door

**MODULE**

**State Diagram:**

startmachine=1, closedoor=1/doorlook\_check=1

start = 0, closedoor= 0

waterdrained=1/drainvalue\_check=1

Detergentadded=1

filledmachine=1/fillvalue\_check=0

Detergentadded=0/detergent\_wash=1

filledmachine=0/fillvalue\_check=1

Adding the Detergent/ Soap

Filling the water

Closing the door

Checkwater\_wash=0/fillvalue\_check=0

spin\_timeout\_check=1/done=1

Checkwater\_wash=1/fillvalue\_check=0

Draining

Cycle for Wash

Machinecycle\_timeout=1/motoron\_check=0

Spinning

Machinecycle\_timeout=0/motoron\_check=1

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drainvalue\_check=1,spin\_timeout\_check=0

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