# aValidation of “Description of States”

To validate the states we will look at the USE-cases again to see if every USE-case is implemented. To do this we look at the basic flow and trigger of every use case and see what states we use to realize this.

We also validate the states to the relations. For every USE-case we looked at what states would be necessary to achieve it.

## Sort unsorted discs

**Trigger:** The user provides unsorted discs and presses the “START” button.

**Post-conditions:** There are no unsorted disks left, All sorted disks are in a container based on their colour

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| Basic Flow | State | Explanation |
| Before Trigger | Resting State | The program first initializes and then waits for the user to press that start button. This waiting happens in the Resting State. |
| After Trigger | Running State | Pressing START/STOP is the input to transition to the running state. |
| 1. An unsorted disc is moved to the colour detector | Running State 2 + Running State 3 | When moving to the colour detector it will have to pass the position Sensor which is the input to move to Running State 2, the disc is then still in front of the position sensor so the program moves to running state 3. |
| 1. The machine decides to which of the two containers the disc needs to be moved | Running State 2 + Running State 3  OR  Motor Up  + White-Wait | Depending on whether the disc is white or black the sorter either needs to move down or keep its down position. If it keeps its down position it should just keep checking for an unsorted disc and when it detects one it will move to running state 3.  If it needs to move up the colour detector will detect a white disc and therefore transition to Motor Up. Moving the sorter up will trigger the pushButton, which is the input to transition to White-Wait |
| 1. The machine moves the disc to the designated container | Running State 2 + Running State 3  OR  Motor Down + Running state 2 | If the sorter did not detect a white disc we are still waiting like in basic flow 2.  If it did detect one then while the disc is moving to the designated container the sorttimer will count down making the machine transition to Motor Down. |
| 1. The machine repeats step 2 through 4 until all discs have been sorted | - |  |
| 1. The machine pauses within 4 seconds | Initial State + Initial State 2 + Resting State | If there are no discs anymore the machine will stay in running state 2 waiting for the timer interrupt which will come within 4 seconds, making the machine transition to initial state.  There it will reset the sorter and transition to the resting state. |
| Post-conditions | Resting State | We repeated the sorting step until all discs where sorted, meaning all discs are now sorted. |

## Abort the process

**Trigger:** The use wants to immediately stop the machine.

**Post-conditions:** The machine stopped running and is ready to start again.

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| Basic Flow | State | Explanation |
| Before Trigger | Every that is not initial state, initial state 2, resting state or Abort cdlsls | The other states cannot be aborted because they go to the resting state anyway. Pressing the abort button will also go the resting state, so it would not make sense to be able to abort these states. |
| After Trigger | Abort | Every state (apart from the one mentioned in before trigger) have a line to abort with Abort as input |
| 1. The machine stops transporting the discs. And doesn’t put any more discs on the transporting mechanism. | Abort | Because the machine is now in the abort state, which has all outputs set to 0, nothing will be moving. |
| 1. The user is required to remove all discs that are neither in the container unit nor sorted. | Abort | The machine will remain in Abort until the user presses START/STOP. This means everything is stopped and the user can safely remove all discs. |
| 1. When the user removed all unsorted discs that where not in the container unit he presses the START/STOP button. | Initial State + Initial State 2 + Resting State | Pressing the START/STOP button is the input for the transition to Initial State  There it will reset the sorter and transition to the resting state. |
| Post-conditions | Resting State | We are in the resting state, so the machine has stopped running. The resting State is also the state from which you can start the machine again. |