



**Subject:**

Design a digital stop watch it has 4 inputs

-**Clock:** is 1Hz which equivalent 1 second

-**Seconds, Minutes**: initial values which stop watch begin to count from its.

**-Start/Stop**: button used to start count and stop it.

and 3 output

**- Seconds, Minutes:** counting value (remain value).

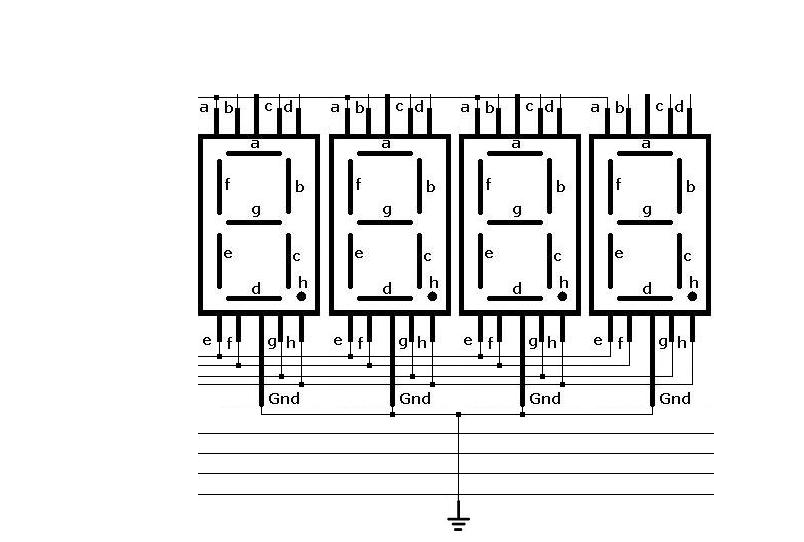
-**Finish:** used to determine the finish of counting.

* For input  
  -**Seconds, Minutes** will be in BCD.

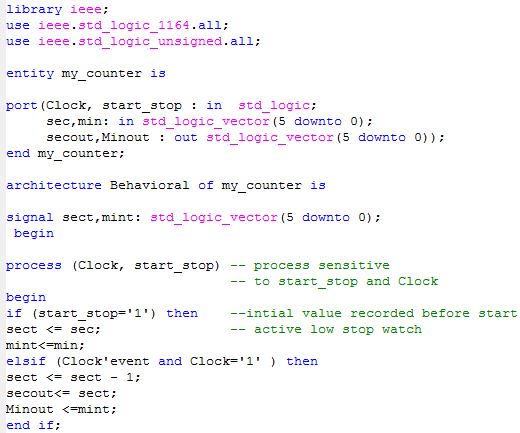
- **Start/Stop** will be active low.

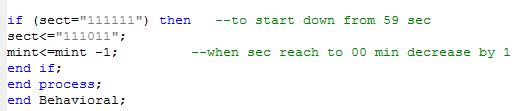
* For output

- **Seconds, Minutes** will show in seven segment display.



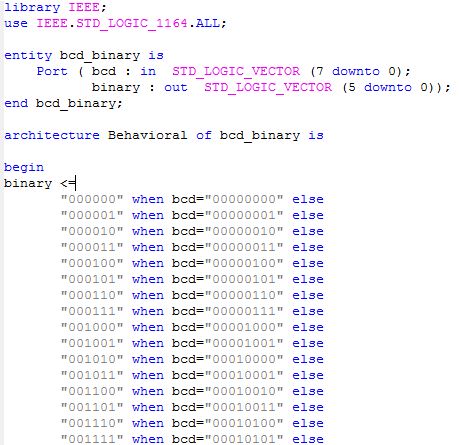
**Steps**:

1-Firstly we use binary counter used to count down from initial value which user enter it before started.

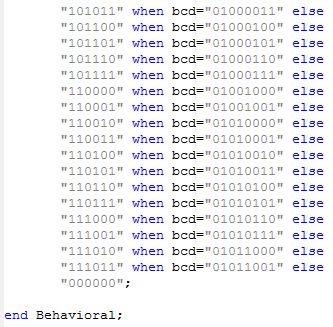


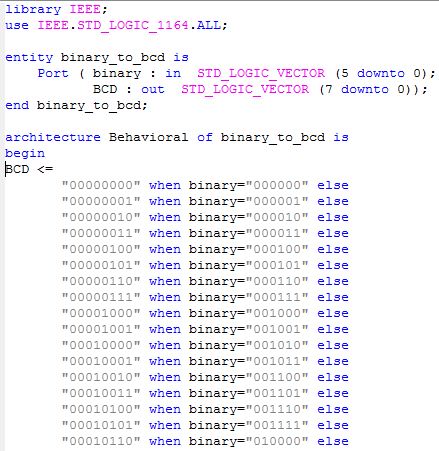
**2**-use BCD to Binary Code to convert BCD input to Binary

And use it as a initial value for counter .

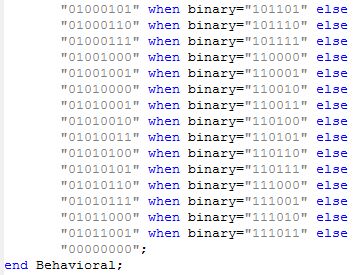


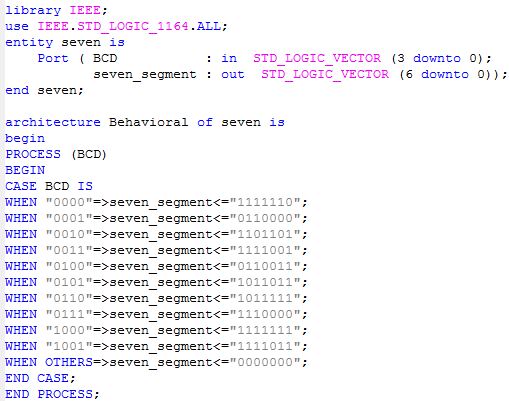




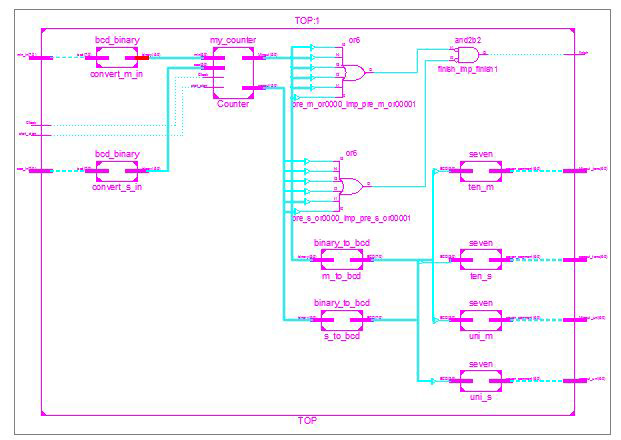
**3-**usinga code witch convert the Binary output to BCD



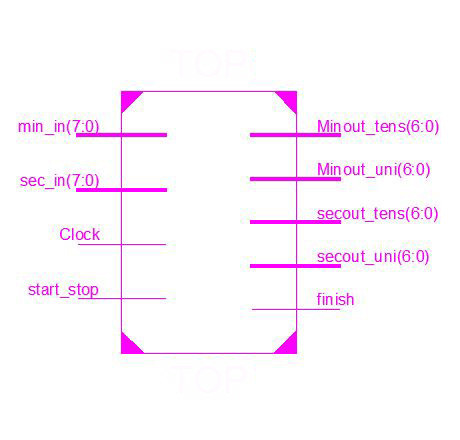


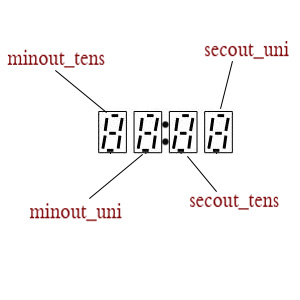
**4-**finally we use code which convert BCD to seven segments.

-Pervious **codes** will use as **components** in top modules code

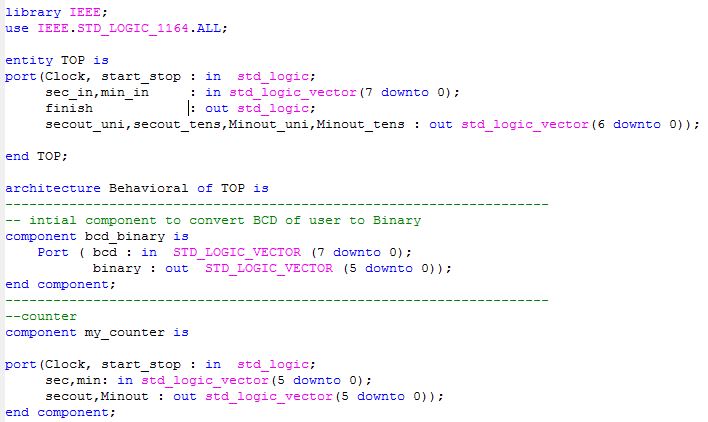


**Components in Top module**

**Top module layout**

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**Top module code:**

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