**Stopwatch**

Abstract:

Design of a stopwatch using previously designed 7-segment display which was implemented in previous assignment. The stopwatch has three buttons for the following purposes :-

1. Start/Continue
2. Pause
3. Reset

Implementation:

First we brought down the frequency of the computer clock which was 100MHz to 10Hz. This 10Hz frequency helped us to display the 1/10 of the second on the stopwatch. Then we used a modulo 10 counter to display the seconds , minutes. Also we used 6 mod counter to represent 10\*seconds. We use component instantiation to create a sort of blackbox for all the primary circuits to be used in the main circuit. This blackbox includes a tendiv(10 modulo counter) , divbysix(6 modulo counter) and used the assignment 4 ‘s circuit as the seg(seven segmant display) to display digits on stopwatch.

We used JK flipflop for implementing the start/continue, apuse and reset buttons of the stopwatch. Jk has similar functioning as SR flipflop and differs only when both the inputs are high(1). We basically ANDed the clock and output of the JK flipflop. We ORed pause and reset buttons to stop the output when we press the reset button.

We basically used invertors before all the n modulo counters to get the right output.

Input:

START/CONTINUE

PAUSE

RESET

Output:

Stopwatch on seven segment display.

Photo:

