Computer Architecture

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Results And Observations for Different assembly files ran on processor pipeline built in this assignment 4:

Assembly file name	**Hash of the state**	**Number of cycles**	**OF stalls**	**Wrong branch instructions**
descending.asm	255541867	658	525	220
evenorodd.asm	-224294686	16	18	4
prime.asm	-1414219998	67	47	28
fibonacci.asm	-1518357572	157	162	36
palindrome.asm	155317940	110	119	18

- We have observed that the hash of the state of processor is same in both cases: whether it is with pipeline or it is without pipeline.
- Large number of cycles are wasted from wrong branches, We can attempt to fix this using branch predictor.
- We see that the number of cycles taken by each program with pipeline implementation dropped substantially to half of the program without the pipeline. In an ideal case, it may reduce to one-fifth of total number of cycles. While in case of data hazards, we additionally add NOP instructions to avoid hazards which inturn increase the total number of cycles. Similarly, the number of wrong branch instructions and number of OF instruction stalls are also affected on the same lines with above reasons to avoid hazards.