

# CS252 Projects

1<sup>st</sup> week

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# The problem

- A processor may have transient execution errors.
- To verify the execution of the processor with a cheap and simple checker.
- Can we verify the execution only by looking at the values of some registers?

# Verification conditions

- We assume that the processor executes instructions correctly most of the time.
- This means we only need to check for errors rarely, not every instruction
- Thus, we will group instructions and verify that the group produces the correct result
- This can be done with verification conditions

# The procedures of our project

- How can we produce verification code?
- How can we verify the execution?
- How can we correct instructions on error?
- How can we tell our idea works well?

# Production of verification code

- We cannot produce perfect verification code because it will cause too big overhead.
- Then we only need to check the values of some registers.

# Verification

- The simplest verification is to check which registers are modified.
- How the code should be produced so that we only need to look at some of the register values?

# Error correction

- Since the instructions have not yet been committed, they can be discarded.
- Execution will restart at the location of the last verification condition.

# Measurement

- We will measure the speed of execution of the new system relative to the single processor version.
- We will measure our effectiveness in detecting errors in execution.