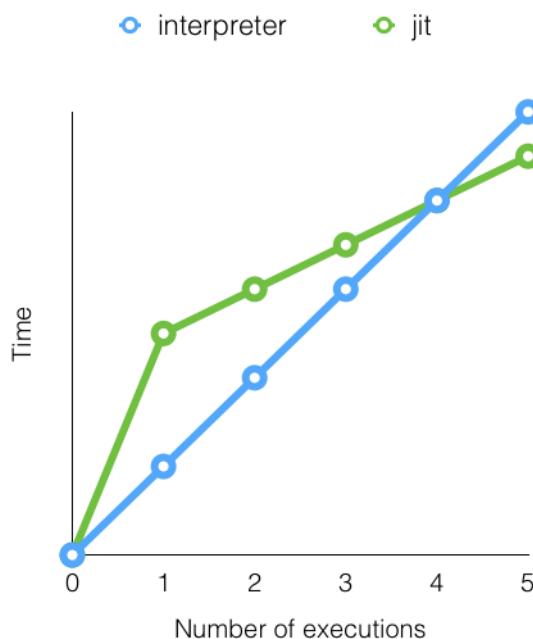1. What tradeoff associated with just-in-time (JIT) compilation is illustrated in the following figure from the last lecture (courtesy of Mario Wolczko)?

The figure shows that while JIT compilation may incur significant overhead (as denoted by the points at number of executions = 1), it may also produce significantly more optimized code (as denoted by the reduced slope of the green line compared to the blue line for number of executions > 1). If the JIT-compiled code is executed enough times, then the compilation overhead can be amortized.

2. What is the benefit of using registers to pass (some) arguments to a function instead of storing all arguments on the stack?

Accessing registers is significantly faster than accessing memory (which is where the stack is stored), so passing arguments through registers can reduce the overhead of calling and executing functions.