

Benchmarking



Measuring program performance on real systems.



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by Christine Alvarado, Mia Minnes, and Leo Porter, 2015.

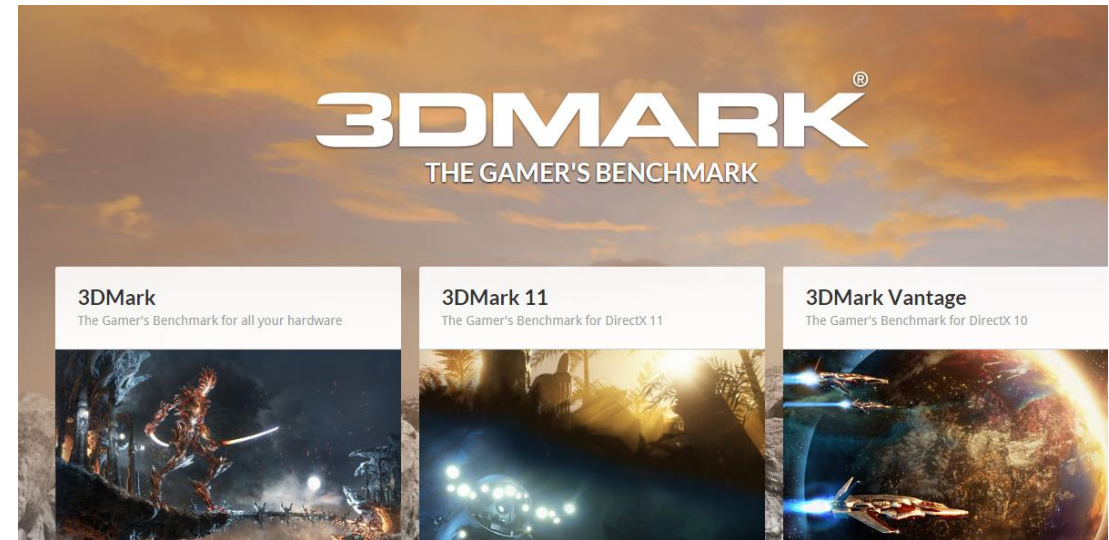
By the end of this video you will be able to...

- Explain the role of benchmarking in computer science
- Identify components of real systems which impact execution time

Benchmarks



www.speedtest.net



www.3dmark.com

Benchmarking



Your Java
Code
Version A

~10 seconds

Benchmarking

Your Java
Code
Version A

~10 seconds

Your Java
Code
Version B

~4 seconds

Benchmarking

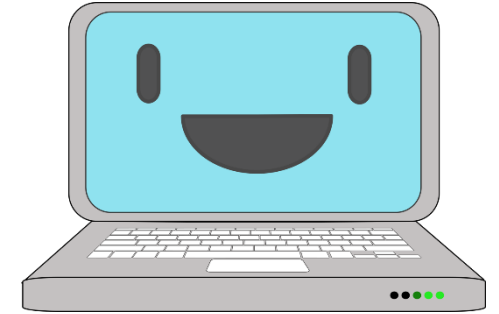
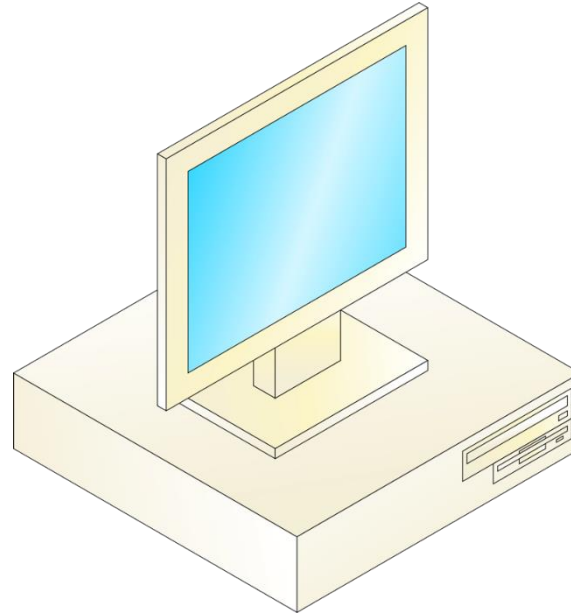
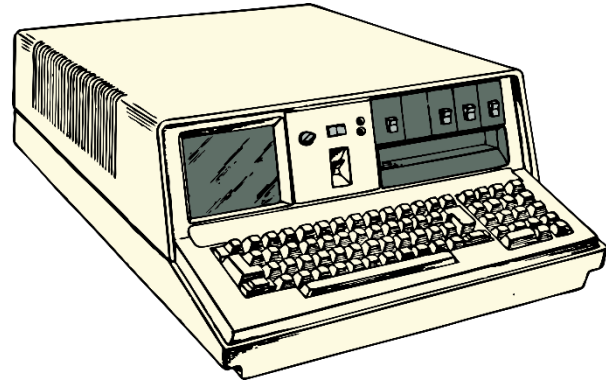
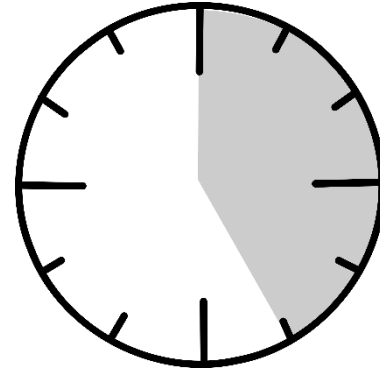
Your Java
Code
Version A

~10 seconds

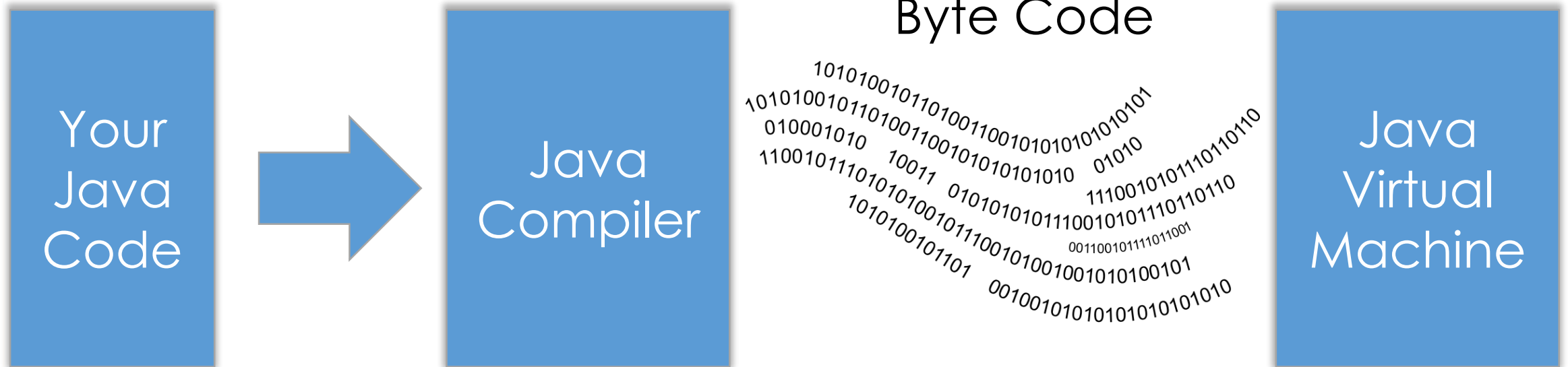
Your Java
Code
Version B

~4 seconds

**Times might not be
consistent....**



Compiler's Role



OS's Role

Java Virtual
Machine

Operating
System

Hardware's Role

Java Virtual
Machine

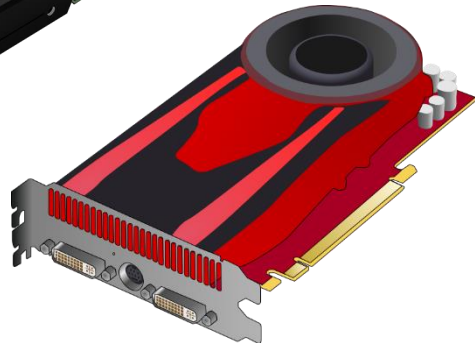
Operating
System



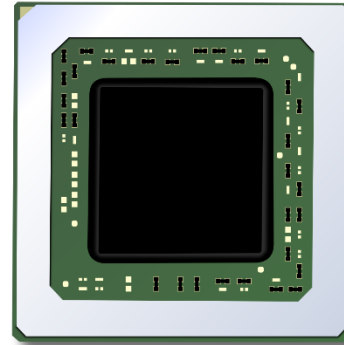
Memory



Hard Disk



Graphics Card



CPU

Whoa!

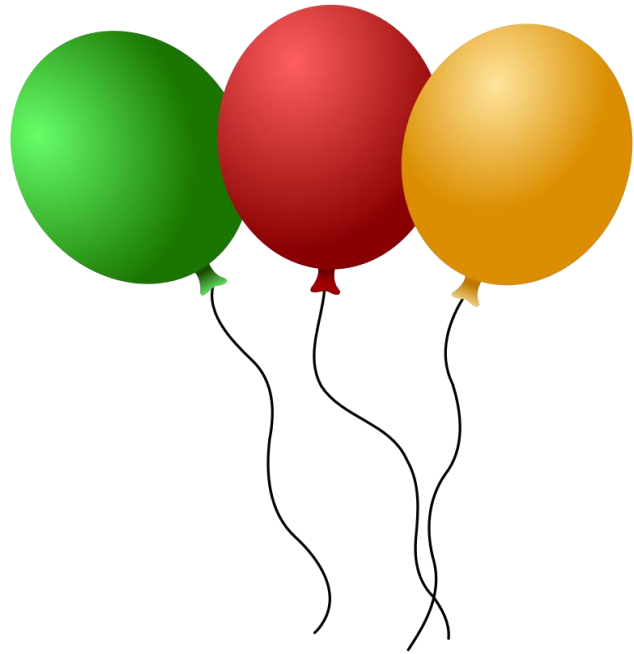


Whoa!



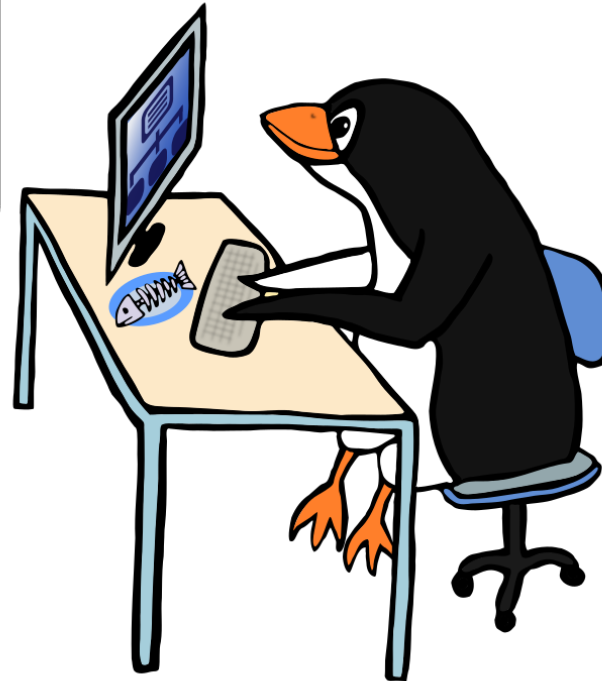
**These systems are
MEANT to be hidden
from you**

Yay Abstraction!



**These systems are
MEANT to be hidden
from you**

Yay Abstraction!



So why break the abstraction?

- Because the running time of a program is influenced by all these things!
- (Optionally) These are really interesting topics in themselves..

Back to Performance...

- So how do we reason about how long it takes for a program to run on real systems?

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how long our
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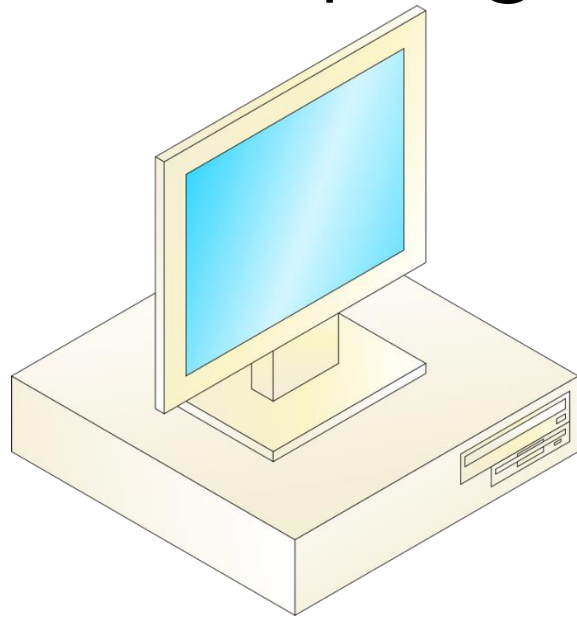
YES!

Benchmarking

- Just means running programs on real machines and measuring performance
- For us right now, “performance” is just how long it takes for something to execute.

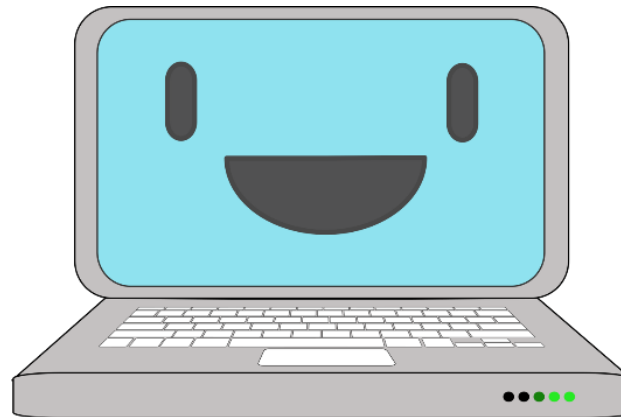
Benchmarking

- Allows us to compare machines by running the same program



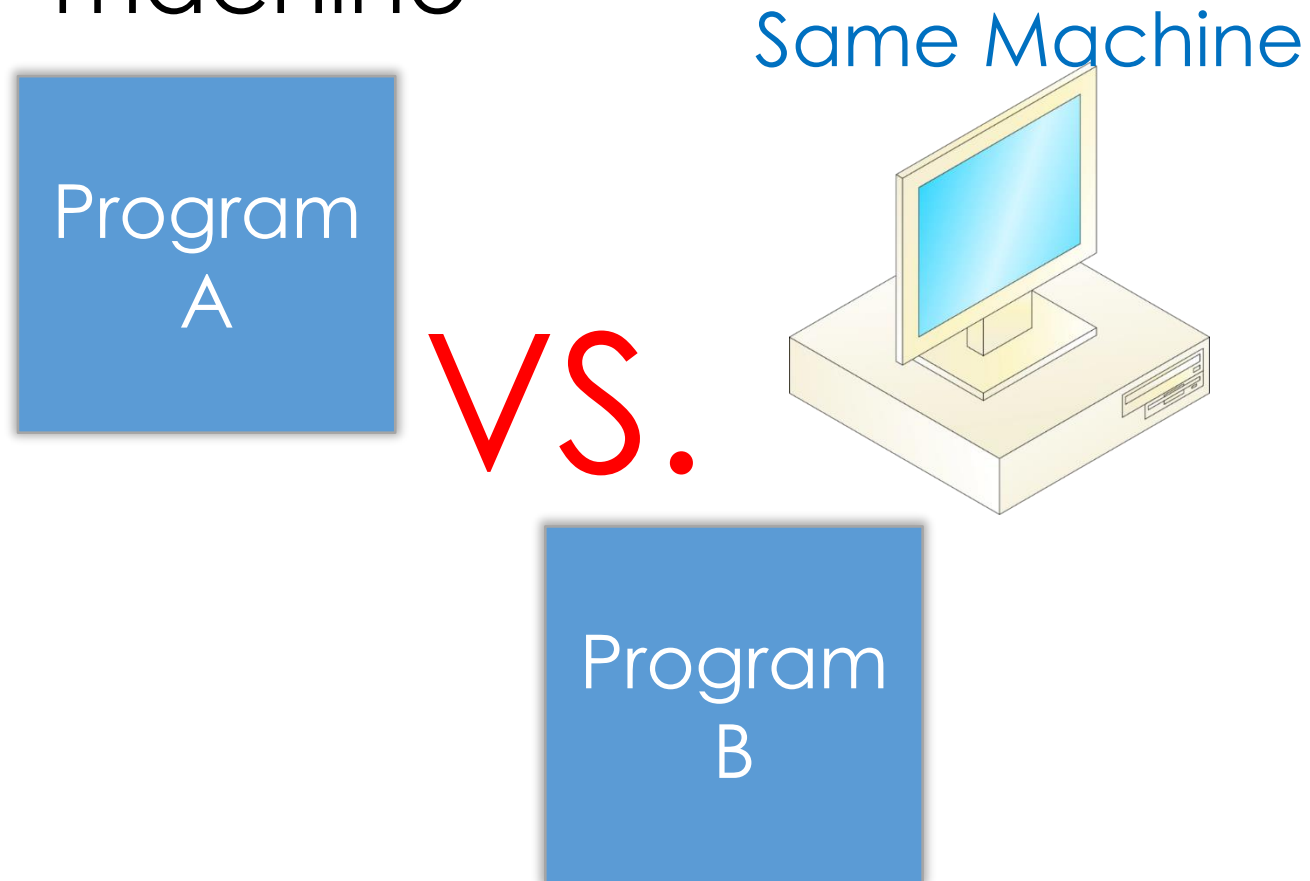
VS.

Same
Program



Benchmarking

- Allows us to compare programs on a single machine



Benchmarking

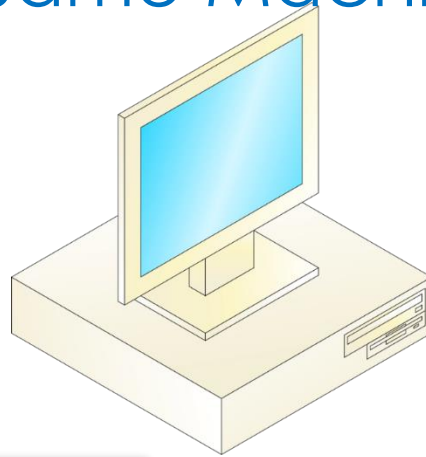
- Allows us to compare programs on a single machine

Same Machine

We'll do this, next!

Program
A

VS.



Program
B