# Big-O Cheat Sheet

Cameron Musco

## $O(x)$ - less than

- Big O
- "$5n$ is $O(n)$ and $O(n^2)$." "Our algorithm runs in..."
- $f < c * g$ for large enough $n$

## $\Omega(x)$ - greater than

- Big Omega
- "$5n^2$ is $\Omega(n^2)$ and $\Omega(n)$". The opposite of Big-O. "Our lower bound shows..."
- $f > c * g$ for large enough $n$

## $\Theta(x)$ - equal to

- Big Theta
- "$5n^2$ is $\Theta(n^2)$". "Furthermore, our bounds are tight..."
- $c_1 * g > f > c_2 * g$ for large enough $n$

## $o(x)$ - less than, not equal to.

- Little O
- "$5n^2$ is $o(n^3)$". "We break a long standing barrier, giving the first algorithm running in time..."
- $f < c * g$ for large enough $n$ and for all $c$. I.e. $\frac{f}{g} \to 0$

## $\omega(x)$ - greater than, not equal to.

- Little Omega
- "$n^2$ is $\omega(n)$". The opposite of Little-O, and as far as I can tell, not very popular.
- $f > c * g$ for large enough $n$ and for all $c$. I.e. $\frac{g}{f} \to 0$