

Tutorial 01 - Asymptotic Analysis  
CS 240E Winter 2022  
University of Waterloo  
Monday, January 16, 2023

1. **little- $\omega$  example:**

Prove from first principles that  $n \in \omega\left(2^{\sqrt{\log n}}\right)$ .

2. **Loop analysis:**

Analyze the following piece of pseudocode and give a tight ( $\Theta$ ) bound on the running time as a function of  $n$ .

```
k := 1
for i from 1 to n:
  j := 0
  while j <= n:
    j := j + k
  k := k * 2
```