

## Quiz 5 Slides

Inner loop:

 $j \leftarrow i = 1$  step (outside of loop) $j \leq n-i = 1$  step $j \leftarrow j+1 = 2$  steps

print "Hi" = 1 step

I will now find the runtime of the inner loop:

$$\begin{aligned} i+k &\leq n-i \\ k &\leq n-2i \end{aligned}$$

$$\begin{aligned} 1 + \sum_{j=i}^{n-2i} (1+2+1) &= 1 + \sum_{j=1}^{n-2i} 4 \\ &= 1 + 4(n-2i) \\ &= 1 + 4n - 8i \end{aligned}$$

Outer loop:

 $i$  will be initialized at 1 (which will take 1 step outside of the loop) $i \leq n = 1$  step $i \leftarrow i+1 = 2$  steps

The rest of the steps will be from the inner loop.

I will now find the runtime of the outer loop:

$$\begin{aligned} 1+k &\leq n \\ k &\leq n-1 \end{aligned}$$