

## COS 488: AC week 3 Q2

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For  $N = 10$ , I ran my code for 100 million trials (where it generates a random permutation and checks if it has any 1 or 2-cycles), and got .22313138. For  $N = 20$ , I ran it for 100 million trials as well, and got .22314688. The asymptotic approximation should be:

$$\frac{1}{e^{H_m}} = \frac{1}{e^{H_2}} = \frac{1}{e^{3/2}} \sim .2231302$$

They differ by about .01%, and thus we expect them both to be roughly this close to the true value (or on this order of difference - since we don't expect both estimations to be skewed in the same direction).