

Pi Estimation 1

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For large n ,

$$R_n = 1 - \frac{1}{3} + \dots - \frac{(-1)^{n+1}}{2n-1} = \sum_{k=1}^n \frac{(-1)^{k+1}}{2k-1} \approx \frac{\pi}{4} \quad (1)$$

giving a way to estimate π :

$$\rho_n = 4R_n \quad (2)$$

Write a function that takes an input n on the upper limit of the above summation and returns an estimate of Pi. Round the estimate to 6 decimal digits of precision.

Example:

```
>> pi_est1(10)
ans =
    3.041840000000000
>> pi - ans
ans =
    0.099752653589793
```