

CECS 451
Assignment 8
Total: 20 Points

General Instruction

- Submit uncompressed file(s) in the Dropbox folder via BeachBoard (Not email).
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1. Implement a program to estimate π using simulation method.

- The program should generate n random points of (x, y) where $0 \leq x < 1$ and $0 \leq y < 1$ for $n \in \{10^3, 10^4, 10^5, 10^6\}$.
- You can use `math.pi` to compute error rates.
- (10 points) Please follow the output format. Note that the estimated π and the error rates may be different. (Fix precision using `"0:.nf".format`)

<code>n = 10 ^ 3</code>	<code>pi =</code>	<code>3.096000</code>	<code>error =</code>	<code>1.4513 %</code>
<code>n = 10 ^ 4</code>	<code>pi =</code>	<code>3.136800</code>	<code>error =</code>	<code>0.1526 %</code>
<code>n = 10 ^ 5</code>	<code>pi =</code>	<code>3.145280</code>	<code>error =</code>	<code>0.1174 %</code>
<code>n = 10 ^ 6</code>	<code>pi =</code>	<code>3.140568</code>	<code>error =</code>	<code>0.0326 %</code>
- (10 points) For $n = 10^4$, draw a scatter plot as Figure 1, i.e., blue color for dots whose distances from the origin $(0, 0)$ are less than 1, otherwise red color.
- Submit `pi.ipynb`.

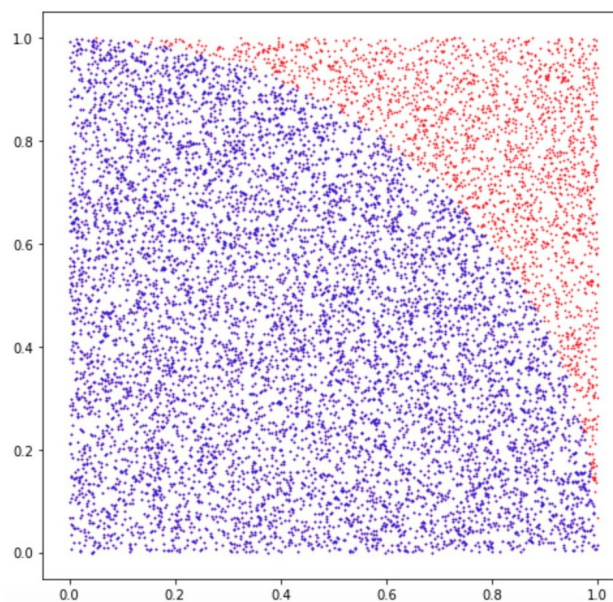


Figure 1: Estimating π using simulation