

Python Tutorial

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Lab 1

Question 1 - Estimate π Monte Carlo

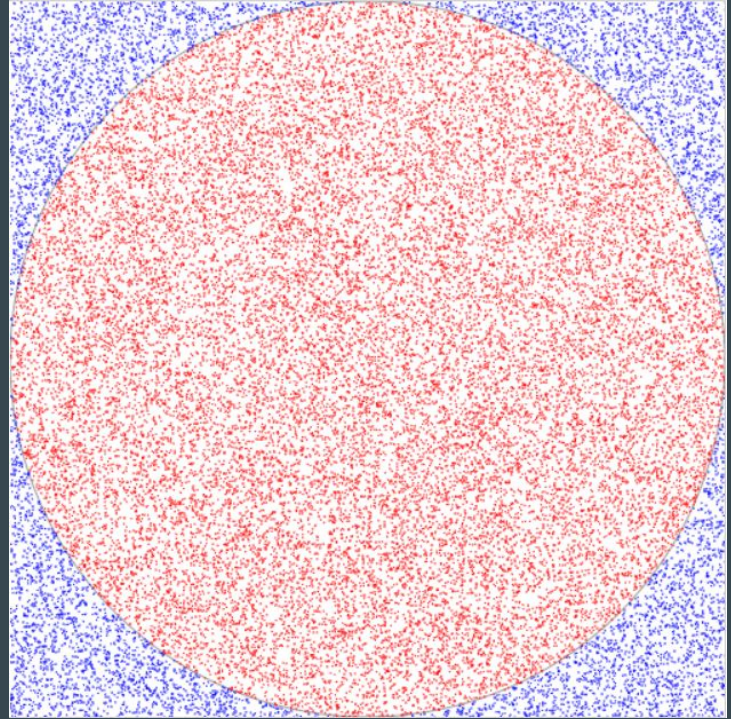
We generate a large number of uniformly distributed random points. Each point is either **inside** the circle or **outside** the circle.

With proper observation, we can find out that

points_inside : points_total equals to

circle area (r^2) : square area($\pi r^2 / 4$)

so $\pi = (\text{points_inside} / \text{points_total}) * 4$



Question 1 - Estimate π Monte Carlo

Please implement a Monte Carlo method to estimate π .

The implementation should allow user to input a integer N [1~1000000]
and output the estimated π .

Question 1 - Sample Output

10000000

3.140728

Question 2 - Password Generator

Please implement a password generator that user can specify

1. length of password
2. include upper case letters or not
3. include punctuator or not

no matter which of above is included, all of the following is include

1. lower case letters
2. digits

Question 2 - Password Generator

useful module - string

```
import string
```

```
print(string.ascii_uppercase)
```

```
print(string.ascii_lowercase)
```

```
print(string.digits)
```

```
print(string.punctuation)
```

```
ABCDEFGHIJKLMNOPQRSTUVWXYZ
```

```
abcdefghijklmnopqrstuvwxyz
```

```
0123456789
```

```
!"#$%&'()*+,-./:;<=>?@[\]^_`{|}~
```

Question 2 - Sample Output

```
Password Length: 15
```

```
Include Uppercase [y/n]: y
```

```
Include Punctuation [y/n]: y
```

```
)%)kR"-8:sx#0<W
```