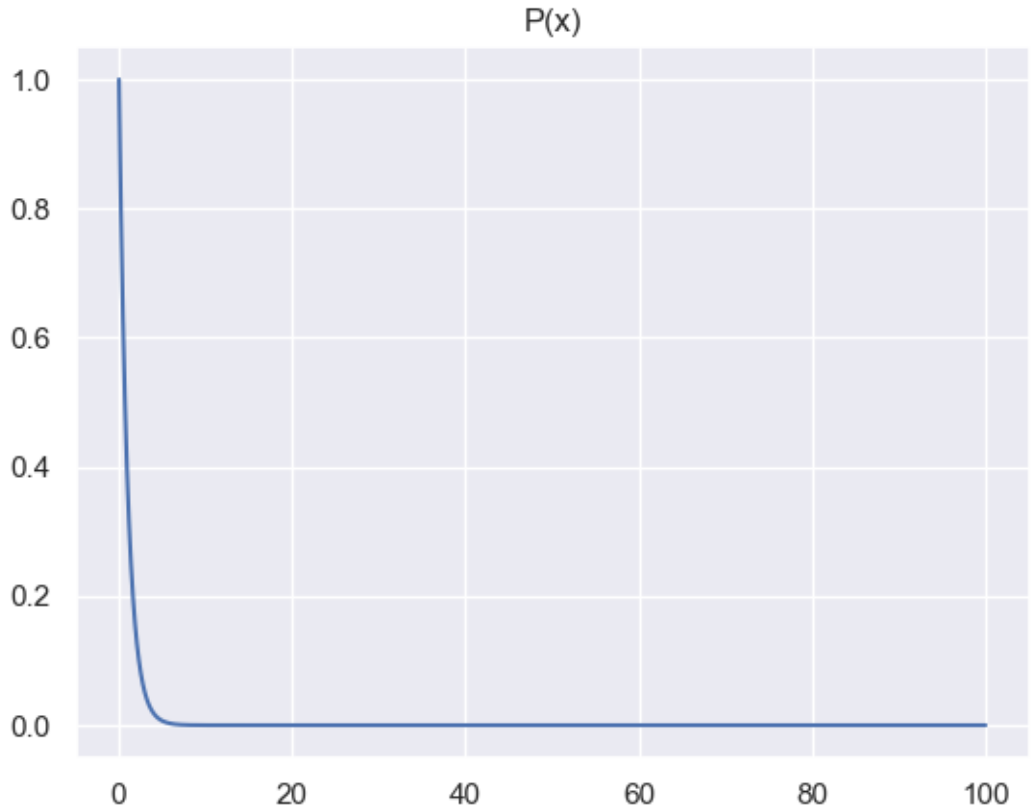
set6

December 25, 2023

[ ]:
```
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
sns.set()
```

[ ]:
```
def ex(x):
    return np.exp(-x)
```

[ ]:
```
X = np.linspace(0,100, 10000)
plt.plot(X, ex(X))
plt.title("P(x)")
plt.show()
```



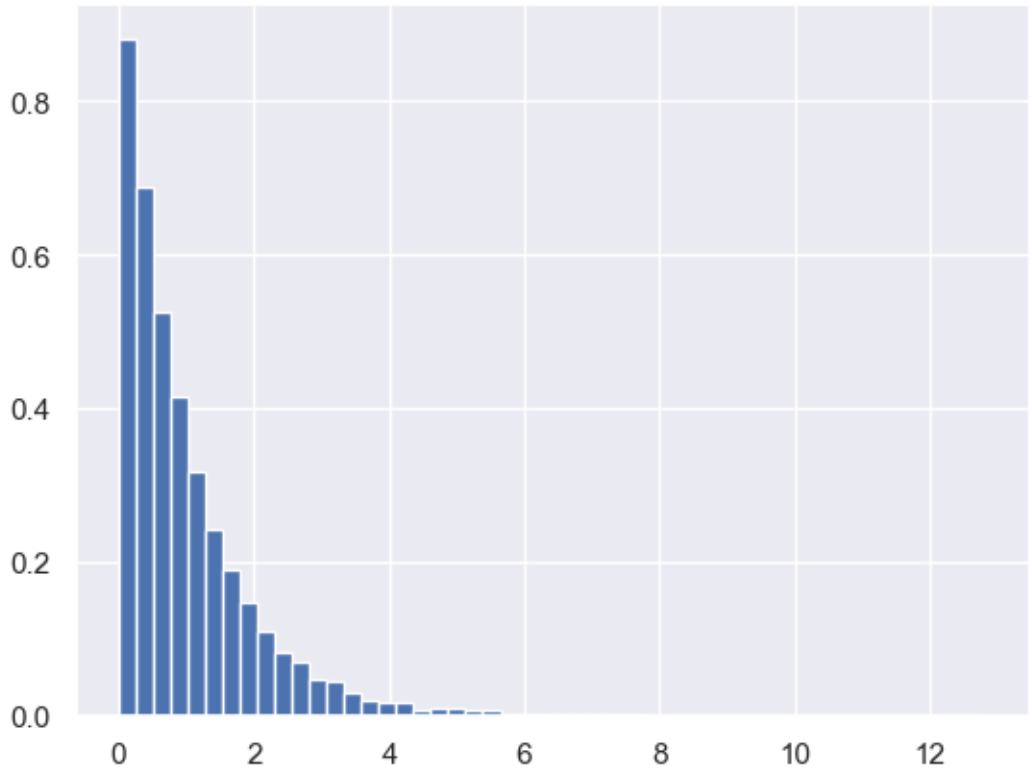
[ ]:
```python
def montecarlo(density, N, a = 0, b = 100):
    """generate random number for specific density

    Args:
        density (func): density function
        N (int): number of points
        a (int, optional): low number for x. Defaults to 0.
        b (int, optional): high number for x. Defaults to 100.

    Returns:
        _type_: _description_
    """
    X = []
    while len(X) < N:
        x = np.random.uniform(a, b)
        y = np.random.rand()
        if y < density(x) :
            X.append(x)
    return X
```

[ ]:
```python
X = montecarlo(ex, 10000)
```

[ ]:
```python
plt.hist(X, density=True, bins=50)
plt.show()
```


0.8
0.6
0.4
0.2
0.0
0
2
4
6
8
10
12

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