Aditya Das

Axd5763

1001675762

Assignment 4

Language used: Python version 3.6.7

Name of the functions:

bernoulli <p>

binomial <n> <p>

geometric <p>

neg_binomial <k> <p>

poisson <λ>

arb_discrete <p 0 > <p 1 > <p 2 > ... <p n >

uniform <a> <b>

exponential <λ>

gamma <α> <λ>

normal <μ> <σ>

NOTE: arb_discrete and neg_binomial have underscores and not '-' in-between them.

Seed value –1343

The seed value is just below the imported libraries at the top of the program.

1.Bernoulli input:

python3 simulateDist.py 10 bernoulli 0.3

Bernoulli output:

```
The bernoulli distribution is
 [0, 1, 1, 0, 0, 1, 0, 0, 0, 1]
```

2.Binomial input: python3 simulateDist.py 10 binomial 8 0.3

Binomial output:

```
[0, 1, 1, 0, 0, 1, 0, 0] 3  is the number of successes
[0, 1, 0, 0, 0, 0, 1, 1] 3  is the number of successes
[0, 1, 0, 1, 0, 0, 0, 1] 3  is the number of successes
[0, 0, 1, 0, 0, 1, 0, 1] 3  is the number of successes
[0, 1, 0, 0, 1, 0, 0, 0] 2  is the number of successes
[0, 0, 0, 1, 0, 0, 0, 0] 1  is the number of successes
[1, 0, 1, 0, 0, 0, 0, 1] 3  is the number of successes
[0, 0, 0, 1, 1, 1, 1, 1] 5  is the number of successes
[0, 1, 0, 1, 0, 0, 0, 0] 2  is the number of successes
[1, 0, 0, 1, 0, 0, 0, 0] 2  is the number of successes
```

3. Geometric input: python3 simulateDist.py 5 geometric 0.32

Geometric output:

```
2 sample(s) were generated for getting a success
[0, 1]
1 sample(s) were generated for getting a success
[1]
3 sample(s) were generated for getting a success
[0, 0, 1]
4 sample(s) were generated for getting a success
[0, 0, 0, 1]
5 sample(s) were generated for getting a success
[0, 0, 0, 0, 1]
```

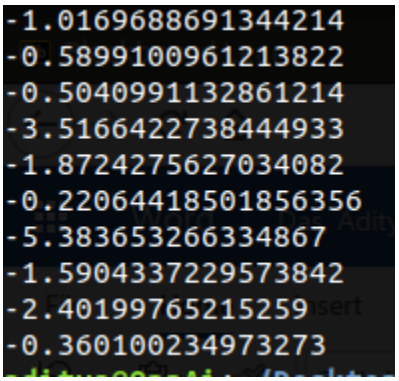
4.Negative binomial input: - python3 simulateDist.py 10 neg_binomial 4 0.031

Negative binomial output: -

```
210 sample(s) were generated before 4 getting successes
38 sample(s) were generated before 4 getting successes
179 sample(s) were generated before 4 getting successes
245 sample(s) were generated before 4 getting successes
124 sample(s) were generated before 4 getting successes
94 sample(s) were generated before 4 getting successes
136 sample(s) were generated before 4 getting successes
123 sample(s) were generated before 4 getting successes
238 sample(s) were generated before 4 getting successes
160 sample(s) were generated before 4 getting successes
```

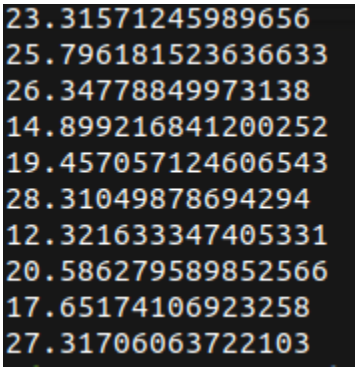
5. Exponential input: python3 simulateDist.py 10 exponential 0.4

Exponential output:-



6. Uniform input: python3 simulateDist.py 10 uniform 10 30

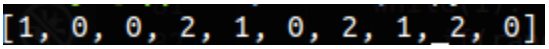
Uniform output:-



7. Arb-discrete input: python3 simulateDist.py 100 arb_discrete 0.33 0.33 0.33 0.01

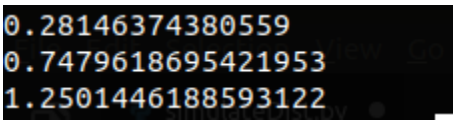
Note!! : python has this weird way of not rounding 0.3+0.3+0.3+0.1 to a 1.0(it keeps it at a 0.9999999). Kindly try a different probability combination if that happens.

Arb-discrete output:



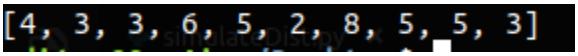
8. Gamma input: python3 simulateDist.py 3 gamma 3 3

Gamma output:



9. Poisson input: python3 simulateDist.py 10 poisson 5

Poisson output:



10. Normal input: python3 simulateDist.py 3 normal 5 10

Normal output: