Homework #5

B05902120 / Yu-Ting, TSENG

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Poisson Distribution

1. Transform the unit of `landa`.

```
 9 time = numb = 0
10 landa = 20.0 / 3600 * -1
11
```

2. Calculate the gap of the meteor appears between this time and the next time by the function $\ln(\texttt{data}) = \texttt{landa}$.

```
12 while 1:
13     data = random.random()
14     time += math.log(data, 2) / landa
15     numb += 1
```

3. Print the result until the time exceed 1 hour.
4. Open the terminal and type "`python Poisson.py`" as the command line. And eventually, get the result.

```
Assignmemt — -bash — 80×24

prodigy1026 at SuperMacBook in ~/Documents/NationalTaiwanUniversity/Sub07-Probab
ility/Assignmemt executing
> python2 Poisson.py
1 -> 00:05:10
2 -> 00:09:37
3 -> 00:10:00
4 -> 00:13:35
5 -> 00:13:46
6 -> 00:15:49
7 -> 00:26:30
8 -> 00:30:35
9 -> 00:31:17
10 -> 00:34:03
11 -> 00:35:42
12 -> 00:41:15
13 -> 00:43:43
14 -> 00:47:47
15 -> 00:47:49
16 -> 00:49:38
17 -> 00:59:42

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ility/Assignmemt executing
```

Normal Distribution

1. Create two data lists and calculate the mean values and standard deviations respectively.
2. Normalize the data and assign to textttnewdx and `newly`.

```
 9
10 datax = np.random.random(10000)
11 datay = np.random.random(10000)
12 meanx = np.mean(datax)
13 meany = np.mean(datay)
14 strdx = np.std(datax)
15 strdy = np.std(datay)
16 newdx = (datax - meanx) / strdx
```

3. Calculate the time of the data by the function $\sqrt{-2\log(\texttt{datax})} * \cos(2\pi * \texttt{data})$.

```
15 strdy = np.std(datay)
16 newdx = (datax - meanx) / strdx
17 newdy = (datay - meany) / strdy
18 graph = np.sqrt(-2 * np.log(datax)) * np.cos(2 * datay * math.pi)
```

4. Plot the graph.

```
17 newdy = (datay - meany) / strdy
18 graph = np.sqrt(-2 * np.log(datax)) * np.cos(2 * datay * math.pi)
19
```

5. Open the terminal and type "`python Normal.py`" as the command line. And eventually, get the result.