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Math 390
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HOMEWORK

1.7 a

Code:

```
data <-
c(2,1,2,4,0,1,3,2,0,5,3,3,1,3,2,4,7,0,2,3,0,4,2,1,3,1,1,3,4,1,2,3,2,2,8,4,5,1,3,1,5,0,2,3,2,1,0,6,4,2,1,6,0,3,
3,3,6,1,2,3)
size <- length(data)
data <-  table(data)
data
data / size
```

Output

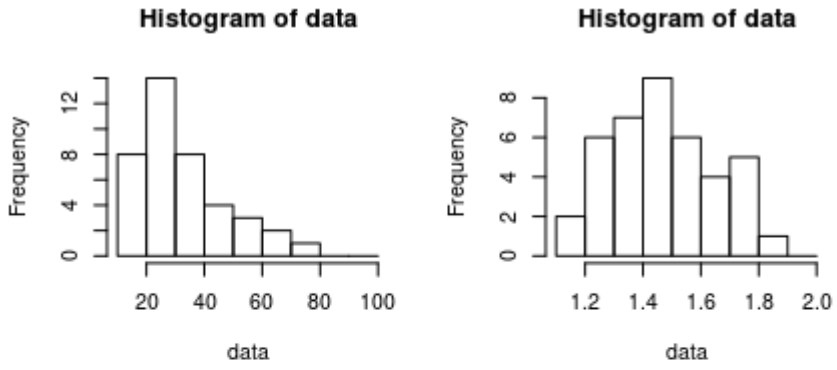
```
> data <-
c(2,1,2,4,0,1,3,2,0,5,3,3,1,3,2,4,7,0,2,3,0,4,2,1,3,1,1,3,4,1,2,3,2,2,8,4,5,1,3,1,5,0,2,3,2,1,0
,6,4,2,1,6,0,3,3,3,6,1,2,3)
> size <- length(data)
> data <-  table(data)
>
>
> data
data
 0  1  2  3  4  5  6  7  8
 7 12 13 14  6  3  3  1  1
> data / size
data
          0          1          2          3          4          5          6          7
8
0.11666667 0.20000000 0.21666667 0.23333333 0.10000000 0.05000000 0.05000000 0.01666667
0.01666667
```

1.16

Code

```
data <-
c(28.1,31.2,13.7,46.0,25.8,16.8,34.8,62.3,28.0,17.9,19.5,21.1,31.9,28.9,60.1,23.7,18.6,21.4,26.6,26.2,32.0,43.5,17.4,38.8,30.6,55.6,25.5,52.1,21.0,22.3,15.5,36.3,19.1,38.4,72.8,48.9,21.4,20.7,57.3,40.9)
hist(data,breaks = seq(10,100,by = 10))
data <- log10(data)
hist(data,breaks = seq(1.1,2.0,by = 0.1))
```

Output



Effect

After using the transformation, the old data now turned into a nice bell-shaped histogram which might follow the normal distribution . Hence, the new data is more symmetric

HW_3_1

Bell-Shaped

One quantity that I can think of that will approximate a bell-shaped curve is the final grade of the class. In which the majority of the class's score is in the middle and a tiny portion of the student has a 4.0 and a tiny portion fail the class. The x axis maybe the grade and the y axis may be the frequency of student getting that grade

Skewed

One quantity that I can think of that will approximate a skewed-right curve is the time spent playing a game for some gamer. Maybe the x axis could be (number of hours that was put in the game and y axis could be frequency of gamer that did that)

. For example, most of the people will play a game for around 50 – 100 hours or less (a small percentage will only play like 1 – 5 hours hence making the graph go up to 100 hours), . But some hardcore gamers might play that games for 500- 2000 hours. This population is small but the amount of time they put into affect the shape, making the histogram shape appear decreasing (making the graph go down)

Exponential Looking

One quanity that I can think of is the number of defects within a computer. The x axis could be number of defects and the y axis could be the frequency of the defects. So given a bunch of computer, a lot might have 0 or 1 defect. But as the number of defects increase, the frequency drop down in an exponential form. Hardly there are any computer that has like 15 defects.

Bimodal

One quanity that I can think of that approximate a bimodal distribution is the score of a given test. This is a special test where the students either get high score or very low score. So there will be 2 peaks in the histogram in which the first peek maybe frequency of students having from 0-20 and the second peak maybe the frequency of students from from 80 – 100.

HW_3_2

Refer to the attached paper

HW_3_3

c)

```
curve(3/14 * (-x^3 + x^2 + x + 2),0,2)
```