

Homework 2

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Coin Toss

A fair coin is tossed fifteen times, and the number of heads is recorded. This trial is repeated nine times. The resulting data should have nine observations of "Number of Head in Fifteen Tosses"

The mean we use is the arithmetic average, which is calculated by first adding the values of all the observations, then dividing by the number of observations.

$$\sum_{i=0}^N x_i = x_1 + x_2 + x_3 + \cdots + x_{42} + x_{43} + x_{44} + x_{45}$$

$$\bar{x} = \frac{\sum_{i=1}^N x_i}{N}$$

$$Dev_{\bar{x}} = (x_i - \bar{x})$$

$$Dev_{\bar{x}}^2 = (x_i - \bar{x})^2$$

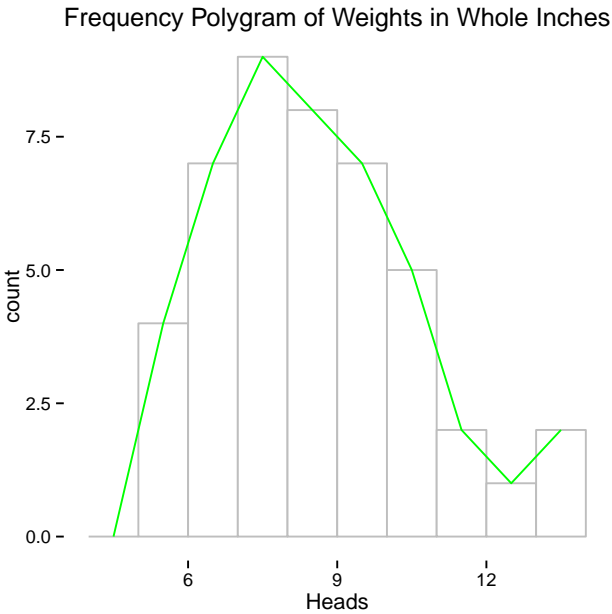
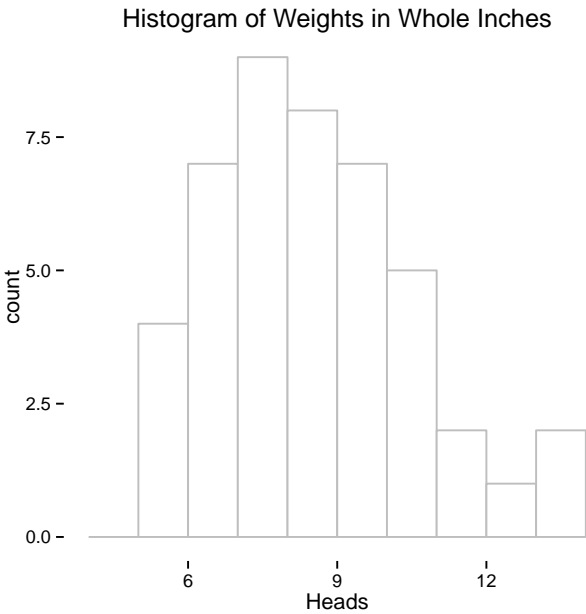
$$Var(X) = \frac{\sum_{i=1}^N Dev_{\bar{x}}^2}{N} = \frac{\sum_{i=1}^N (x_i - \bar{x})^2}{N}$$

$$StdDev(X) = \sqrt{Var(X)}$$

Observation	Heads	$Dev_{\bar{x}}$	$Dev_{\bar{x}}^2$
x_1	6	-2.0	4.0
x_2	7	-1.0	1.0
x_3	10	2.0	4.0
x_4	5	-3.0	9.0
x_5	9	1.0	1.0
x_6	6	-2.0	4.0
x_7	6	-2.0	4.0
x_8	9	1.0	1.0
x_9	11	3.0	9.0
x_{10}	8	0.0	0.0
x_{11}	5	-3.0	9.0
x_{12}	9	1.0	1.0
x_{13}	10	2.0	4.0
x_{14}	7	-1.0	1.0
x_{15}	8	0.0	0.0
x_{16}	10	2.0	4.0
x_{17}	6	-2.0	4.0
x_{18}	7	-1.0	1.0
x_{19}	8	0.0	0.0
x_{20}	6	-2.0	4.0
x_{21}	7	-1.0	1.0
x_{22}	8	0.0	0.0
x_{23}	6	-2.0	4.0
x_{24}	11	3.0	9.0
x_{25}	7	-1.0	1.0
x_{26}	9	1.0	1.0
x_{27}	8	0.0	0.0
x_{28}	7	-1.0	1.0
x_{29}	9	1.0	1.0
x_{30}	8	0.0	0.0
x_{31}	8	0.0	0.0
x_{32}	6	-2.0	4.0
x_{33}	5	-3.0	9.0
x_{34}	9	1.0	1.0
x_{35}	7	-1.0	1.0
x_{36}	7	-1.0	1.0
x_{37}	10	2.0	4.0
x_{38}	9	1.0	1.0
x_{39}	5	-3.0	9.0
x_{40}	12	4.0	16.0
x_{41}	13	5.0	25.0
x_{42}	10	2.0	4.0
x_{43}	8	0.0	0.0
x_{44}	13	5.0	25.0
x_{45}	7	-1.0	1.0
Total	362	0	184.0
Total over N	8.0	0	4.1
Average	Zero	Variance	

Table 1: Number of Heads in Fifteen Tosses

A frequency table and histogram visualize the center and spread with the mean as a center.



Heads	Frequency	CumulativeFrequency	ecdf
5	4	4	0.089
6	7	11	0.244
7	9	20	0.444
8	8	28	0.622
9	11	39	0.778
10	10	49	0.889
11	2	51	0.933
12	1	52	0.956
13	2	54	0.956
14	0	54	1.000

Figure 1: Histograms with Frequency Polygon and Ogive (Cumulative Frequency Polygon). The Height data set is unimodal, skewed right, with out outlier on the left.

Figure 2: Histograms with Frequency Polygon and Ogive (Cumulative Frequency Polygon). The Height data set is unimodal, skewed right, with out outlier on the left.

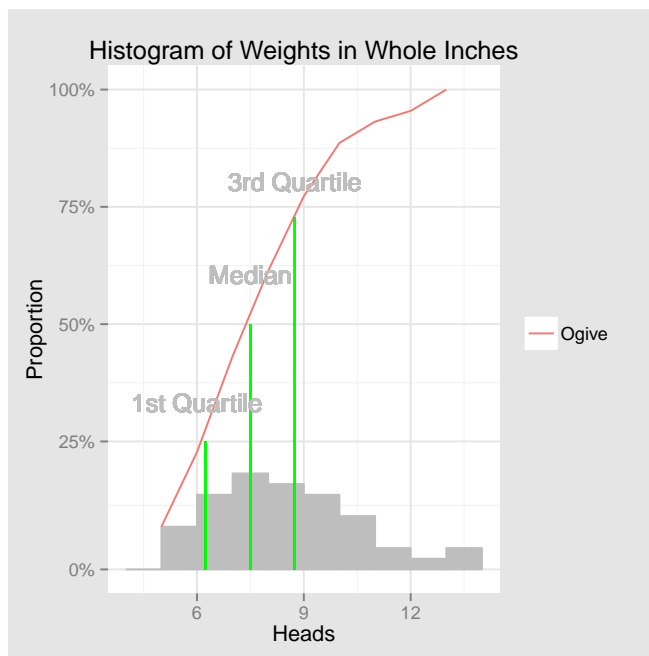


Figure 3: Histogram with Ogive (Cumulative Frequency Polygon).