

## Homework 2

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### M&Ms©Data

M&Ms© are the colorful candy coated chocolate candies, and are sold with an advertised net weight of 47.9 grams.

Some curious students acquired 30 packages of M&Ms© and counted the number of candies in each package, and the total weight of those M&Ms©. After this strenuous exercise, they consumed the evidence.

Using the columns method, compute the Average and Variance of the weight of the candies in the packages, in grams.

The **mean**. The mean is the center that we will use to further examine the “spread” of the values.

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.

<http://www.mms.com/>

The **Mean** of a data set refers to the arithmetic mean of the values, denoted  $\bar{x}$

$$\sum_{i=0}^n x_i = x_1 + x_2 + x_3 + \cdots + x_{27} + x_{28} + x_{29} + x_{30}$$

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

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

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

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

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

$$\begin{aligned} &= 46.220 + 46.720 + 46.940 + 47.610 + 47.670 + 47.700 + 47.980 + 48.280 + \\ &48.330 + 48.450 + 48.490 + 48.720 + 48.740 + 48.950 + 48.980 + 49.160 + \\ &49.400 + 49.690 + 49.790 + 49.800 + 49.800 + 50.010 + 50.230 + 50.400 + \\ &50.430 + 50.970 + 51.530 + 51.680 + 51.710 + 52.06 = 1476.44 \end{aligned}$$

Observation	Weight	$Dev_{\bar{x}}$	$Dev_{\bar{x}}^2$
$x_1$	46.22	-2.995	8.968
$x_2$	46.72	-2.495	6.223
$x_3$	46.94	-2.275	5.174
$x_4$	47.61	-1.605	2.575
$x_5$	47.67	-1.545	2.386
$x_6$	47.70	-1.515	2.294
$x_7$	47.98	-1.235	1.524
$x_8$	48.28	-0.935	0.874
$x_9$	48.33	-0.885	0.783
$x_{10}$	48.45	-0.765	0.585
$x_{11}$	48.49	-0.725	0.525
$x_{12}$	48.72	-0.495	0.245
$x_{13}$	48.74	-0.475	0.225
$x_{14}$	48.95	-0.265	0.070
$x_{15}$	48.98	-0.235	0.055
$x_{16}$	49.16	-0.055	0.003
$x_{17}$	49.40	0.185	0.034
$x_{18}$	49.69	0.475	0.226
$x_{19}$	49.79	0.575	0.331
$x_{20}$	49.80	0.585	0.343
$x_{21}$	49.80	0.585	0.343
$x_{22}$	50.01	0.795	0.633
$x_{23}$	50.23	1.015	1.031
$x_{24}$	50.40	1.185	1.405
$x_{25}$	50.43	1.215	1.477
$x_{26}$	50.97	1.755	3.081
$x_{27}$	51.53	2.315	5.361
$x_{28}$	51.68	2.465	6.078
$x_{29}$	51.71	2.495	6.227
$x_{30}$	52.06	2.845	8.096
Total	1476.44	0.000	67.174
Total/N	49.215	0.000	2.239
	Mean	Zero	Variance

Table 1: Deviations

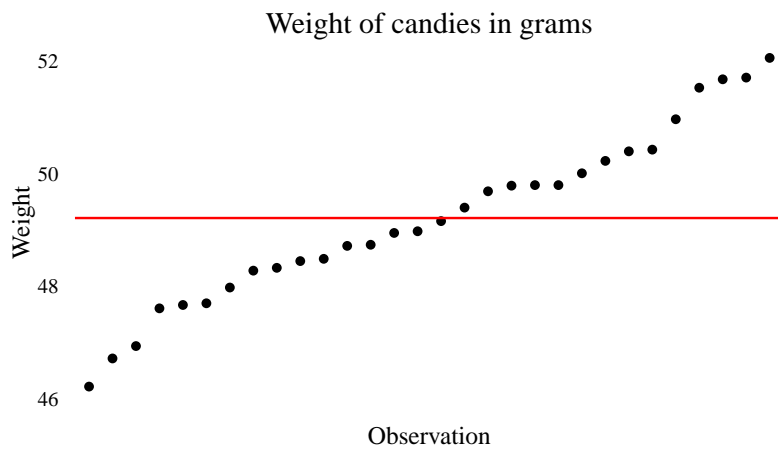


Figure 1: Draw a line at the Mean