

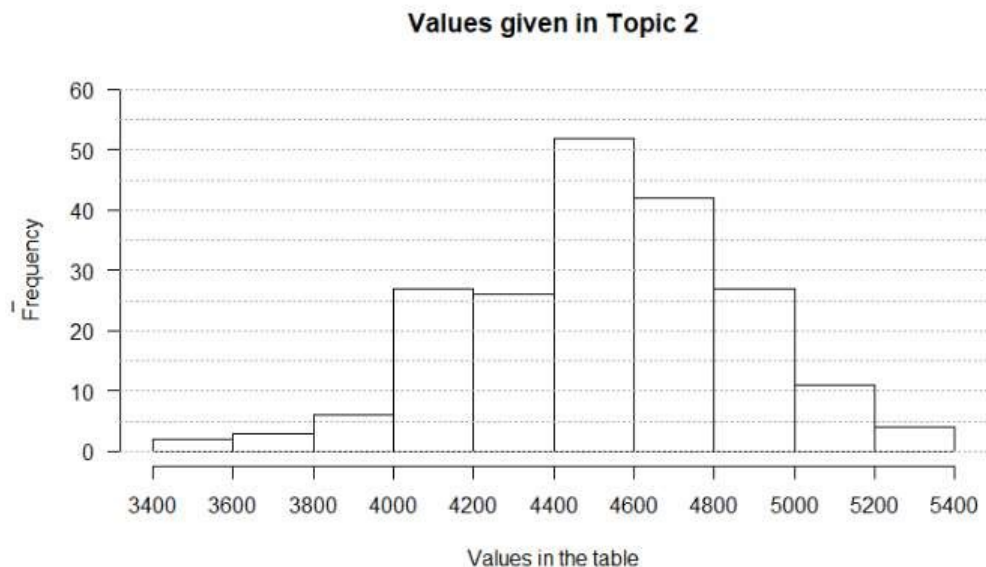
Topic 2 (continued)

Consider the following 200 numbers

4489.1 4639.5 4573.3 4423.3 4373.2 4504.8 4723.9 4207.3 4568.3 4393.5
4432.3 5009.2 4591.5 4695.2 4129.6 4412.9 4143.5 4904.2 4993.6 4280.8
4863.7 4266.5 4649.0 4724.6 5019.1 4138.4 4403.9 4283.3 3920.6 4319.7
4553.8 4004.6 4371.7 4721.8 5146.4 4824.7 4379.5 4675.1 4523.9 4803.9
4098.1 4966.7 4900.8 5018.7 4774.0 4986.8 4638.9 3976.4 4833.5 4544.4
3766.7 4112.6 4405.2 4810.2 4422.3 4774.5 4630.0 4691.4 4110.6 4330.9
4769.0 4245.1 4670.1 4654.5 4708.4 3557.0 4567.2 5020.6 4819.5 4448.4
4072.5 4703.3 4459.1 4995.2 4684.0 4446.1 4340.7 4560.9 4810.6 4532.3
4753.5 4700.4 4453.5 4804.5 4119.4 4469.6 4789.4 4460.5 4840.8 5369.1
4612.2 5373.4 4916.3 4391.9 4812.6 4567.1 4455.9 4162.5 4448.5 5162.2
4859.3 4515.7 4665.1 4753.3 4465.7 4504.4 4888.1 4201.2 4734.6 4486.0
4388.4 5132.2 5073.4 4190.0 4206.6 4727.4 4453.7 4680.1 4045.7 4338.4
4122.7 4735.7 3961.5 3970.5 4612.1 3975.1 4557.5 4240.4 4466.3 4987.3
4408.7 4856.4 4188.7 4577.7 4447.8 4245.7 4508.3 4466.2 4189.2 4298.5
3720.4 3804.8 4120.0 5313.4 4409.8 4307.9 4679.5 4031.8 4614.0 4409.6
4137.9 4327.4 5367.2 4406.6 4738.1 4094.1 4106.1 5048.4 5001.5 4484.3
4122.5 4478.6 3746.8 4159.0 4782.9 4768.6 4596.7 4683.3 4486.2 4849.1
4382.1 4641.0 4680.1 4496.6 4874.5 4263.9 4555.9 4528.1 4620.2 4982.5
4092.5 4203.7 4261.5 4451.7 4095.4 4121.4 4621.8 4515.0 5013.8 4645.4
3470.0 4538.2 4732.6 4096.0 4810.5 4582.8 4032.0 4958.0 4616.1 4936.7

We could look at them for a long time and still not get any "feeling" for those values. But, we could describe them by saying that they range from 3470.0 to 5373.4, or by saying that half the values are less than 4526 and half are greater than that value, or by saying that the "average" value is about 4521.73. Those are descriptive measures. Another, which we will define much later, is to say that the standard deviation of those 200 values is about 340.025.

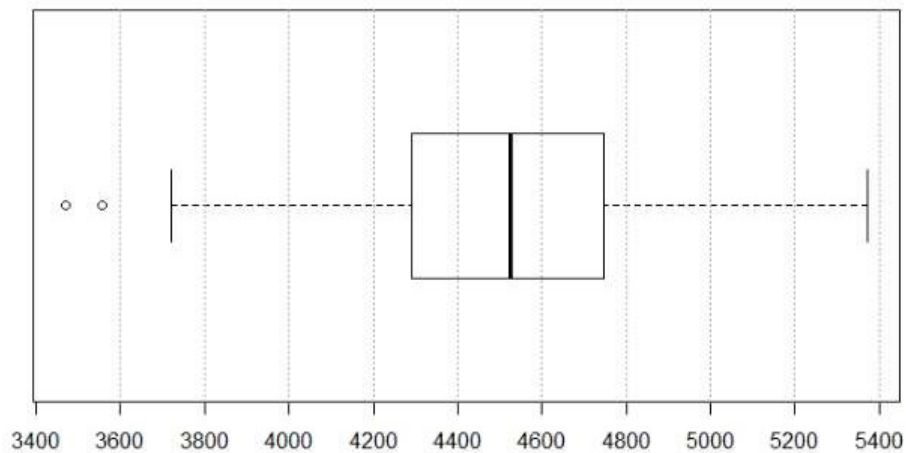
A histogram of the values gives us a good picture of them.



This histogram shows us that there are very few "extreme" values, those at the low and high end of the range, and that the highest frequency of values is between 4400 and 4600. In fact, almost all of the values are between 4000 and 5000.

Or, a box and whisker plot of the data gives us a different view of the spread of the values.

Values given in Topic 2



In this plot we can see that half the values are less than 4526, the location of the wide central bar. In fact this plot tells us that about a quarter of all the values are between 4294.7, the location of the left end of the box, and 4526, while another quarter of the values are between 4526 and 4741.9, the location of the right end of the box. [The specific values are not displayed in the plot. We can get those values from various R commands. The plot just gives us a graphic representation.]