

# Assignment

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For all "hypothesis testing" questions, make sure to provide explicit answers with your work shown for all 11 steps of a hypothesis test.

## Preference for Bottled Water?

Students in an Introduction to Environmental Studies course conducted a study to determine preferences (or not) for types of drinking water. In one part of their study, a sample of students was given four types of drinking water in clear unmarked cups. The water was either from the local water source (tap water) or bottled water from Aquafina, Fiji, or Sam's Choice. Each subject tried each sample of water, without knowing which type they were trying, and then recorded their "preference ranking." They found that 51, 18, 17, and 21 subjects rated tap water, Aquafina, Fiji, and Sam's Choice options, respectively, as their least-preferred choice. Use these results to determine, at the 1% level, if there is any differences in the least-preferred choice of drinking water.<sup>1</sup>

## Habitat Use by Wild Turkeys

Rumble and Anderson (1992) examined habitat use by Merriam's Wild Turkey (*Meleagris gallopavo merriami*) in South Dakota. In one part of their study they identified the major vegetative type (called Habitat below) in 4-32 hectare sampling units. They then computed the proportions of total area available to turkeys by major vegetation type (first row below). Turkeys' were trapped and fit with radio transmitters. Each bird was then located three times per week with the location of the bird being recorded. The frequency of locations by each major vegetation type was computed for each of four seasons. The area available and the seasonal frequency of turkey locations in each habitat are shown below.

Habitat	Aspen	Meadow	Pine	Oak/Spruce
Area Available	0.0516	0.1016	0.8371	0.0100
Winter Use	4	11	186	4
Spring Use	61	9	807	1
Summer Use	17	5	100	4
Fall Use	14	7	195	2

Use these results to determine, at the 5% level, if the turkey's exhibited a habitat preference in the **Spring**.

## Random Jury Pool?

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A defense attorney claimed that a jury pool is not representative of the larger population in the court's district. In particular, she was concerned that the jury pool contained fewer "young people" than would be expected based on district demographics. To test her claim, she created seven age categories, counted the number of individuals from the jury pool in each age category, and found the percentage of the district in each age category from the most recent census data. Her findings are below.

Ages	18-19	20-24	25-29	30-39	40-49	50-64	65+
Jury Pool	23	96	134	293	297	380	113
District	6.1%	15.0%	13.5%	21.7%	15.3%	18.2%	10.2%

Use these results to determine, at the 10% level, if the age distribution in the jury pool accurately represents the age distribution of the district as a whole. Also comment on whether the attorney's specific concern was warranted.

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