L1. Presentation of Data

Example 1: Volcano Vents

In May of 2018, Hawaii's Mount Kilauea's lava forced 17,000 to evacuate; but locals still asked the US Geological Survey if they could roast marshmallows on volcanic vents. The answer was no, unless you like poison-gas and sulphuric acid on your snacks. Someone then asked if it was ok to roast hot dogs over the vents [a] .

Sixty residents were asked how much they had spent on hot-dogs and marshmallows last May. Their responses rounded to the nearest dollar are shown below.

90	92	92	93	95	95	96	96	97	98	98	100	102	103	104
104	104	107	107	108	109	111	112	114	114	115	119	120	120	122
123	126	128	129	129	132	134	134	135	136	137	137	139	139	139
139	140	140	140	141	141	141	144	144	145	145	146	146	147	150

a. Divide the data into seven classes and construct a table showing the: class limits, class boundaries, frequencies, relative frequencies, less-than cumulative frequencies, and more-than cumulative frequencies.

b. The most frequently occurring category contained _____ Hawaiian residents. They spent between _____ and _____ on marshmallows and hot-dogs last May.

c. What is the probability that a randomly selected person spent at least $126 on hot-dogs?

d. What is the probability that a randomly selected person spent $116 or less on hot-dogs?

[a] https://time.com/5293693/kilauea-volcano-usgs-marshmallow/

Solution

Example 2: Landscape in Snow

To spruce up the White House, Donald Trump once asked the Guggenheim to lend him Van Gogh's "Landscape with Snow." The museum declined; and offered to send a gold toilet instead! The White House never responded to the museum's counteroffer [a].

The amount of time in seconds, that thirty visitors spent admiring "Landscape with Snow" is shown below.

189	191	263	265	272	274	275	292	336	351
375	400	414	418	423	426	430	445	447	474
477	493	513	520	557	558	565	568	589	592

a. Divide the data into six classes and construct a table showing the: class limits, class boundaries, frequencies, relative frequencies, less-than cumulative frequencies, and more-than cumulative frequencies.

b. What is the probability that a randomly selected visitor spent 393 seconds or more looking at the painting?

c. What is the probability that a randomly selected visitor spent at most 324 seconds or less, looking at the painting?

d. What is the probability that a randomly selected person spent either at most 256 seconds or at least 461 second looking at the painting?

e. Sketch the frequency distribution for the data.

[a] https://www.culturedmag.com/article/2023/01/24/donald-trump-maurizio-cattelan-guggenheim-vincent-van-gogh

Solution

Example 3: Vexations

'Vexations' (1893) is a piano piece that is supposed to be played 840 times - *very slowly*. The first performance, was in 1963, and it lasted for more than 18 hours. At the end, one audience member shouted 'Encore!'[a]

The time it takes in minutes for 30 people to learn to play Vexations is presented below:

62	63	65	68	74	81	83	84	85	87
94	97	98	110	116	117	117	123	125	127
131	136	140	140	155	155	156	164	171	178

a. Divide the data into seven classes and construct a table showing the: class limits, class boundaries, frequencies, relative frequencies, less-than cumulative frequencies, and more-than cumulative frequencies.

b. What is the probability that a randomly selected visitor spent at most 112 minutes learning to play the piece?

c. What is the probability that a randomly selected visitor spent at least 130 minutes learning to play Vexations?

d. How many people took between 164 to 180 minutes to learn the piece?

e. Sketch the more-than cumulative frequency (%) distribution.

[a] https://www.theguardian.com/music/2016/jun/25/erik-satie-vexations-furniture-music

Solution