

Data Analytics

Assignment 3.1

- 1) As voters exit the polls, you ask a representative random sample of 6 voters if they voted for proposition 100. If true percentage of voters who vote for proposition is 55.1%, what is probability that, in your sample exactly 2 voted, and 4 did not.

Sol'n

$$n = 6$$

% of voters, who vote favourably is

$$55.1$$

$$\therefore p = 0.551$$

$$q = 1 - p = 1 - 0.551 \\ = 0.449$$

According to Bernoulli, the probability is,

$$P(6, 2) = \binom{6}{2} p^2 q^4$$

$$= {}^6C_2 (0.551)^2 (0.449)^4$$

$$= 15 \times 0.3036 \times 0.04064$$

$$= 0.18489$$

\therefore So the probability for the given scenario is 18.49%.

32)

Students results are

20, 15, 26, 32, 18, 28, 35, 14, 26, 22, 17.

most students didn't even get 30 out of 60.

The test must have been really hard. So, the prof decides to standardize all the scores and only fail people 1 standard deviation below the mean.

So, mean is

$$\frac{253}{11} = 23.$$

we need to find standard deviation.

$$S.D. = \sqrt{\frac{1}{N} \sum_{i=1}^N (x_i - \mu)^2}$$

$$= \sqrt{\frac{484}{11}}$$

$$= \sqrt{44}$$

$$\approx 6.63$$

$$\text{So, } 23 - 6.63 \approx 16.37$$

below 16.37, the students will fail.

So two of the students will fail (one who scored 15 & 14 on the test).