

# LAB SESSION 2 – DISTRIBUTIONS

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Analytics Primer

# SUMMARIZING A DISTRIBUTION WITH OUTLIERS

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# Example

- A marketing firm collected data on annual household incomes for Outland, NC. They surveyed all 182 households in the small town of Outland. Now imagine that one of the marketing firm's vice presidents really liked the city after collecting data from them and moves to the city. Now the data set has 183 households. The vice president's household's annual income is \$384,000. Recalculate the mean, median, standard deviation, skewness, and kurtosis.

# EDUCATION AND INCOME LEVEL TABLE

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# Example

Income (thousands)	No College	Some College	Associate s Degree	Bachelors Degree	Masters Degree	Doctorate
<\$30	40	25	24	30	2	1
\$30 < \$50	38	40	42	88	25	4
\$50 < \$70	10	11	15	50	41	9
> \$70	2	3	11	21	13	10

# Example

- What is the probability someone makes between \$30 and \$50 thousand **and** has a Master's degree?

$$\frac{25}{555} = 0.045$$

# Example

- What is the probability someone makes between \$30 and \$50 thousand **or** has a Master's degree?

$$\frac{237}{555} + \frac{81}{555} - \frac{25}{555} = \frac{293}{555} = 0.53$$

# Example

- What is the probability someone makes less than \$30 thousand?

$$\frac{122}{555} = 0.22$$



# Example

- What is the probability someone makes less than \$30 thousand **given** that they did not have any college?

$$\frac{40}{90} = 0.44$$

OR

$$\frac{\binom{40}{555}}{\binom{90}{555}} = \left( \frac{40}{555} \right) \times \left( \frac{555}{90} \right) = 0.44$$