DATA SCIENCE
CLASS 2: LINEAR REGRESSION

0. BASIC FORM
II. CATEGORICAL VARIABLES

0. BASIC FORM

Q: What is the motivation for learning about linear regression?

- widely used
- runs fast
- easy to use (not a lot of tuning required)
- highly interpretable
- basis for many other methods

	continuous	categorical
supervised	????	?????
unsupervised	????	?????

	continuous	categorical
supervised	regression	classification
unsupervised	dimension reduction	clustering

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ε = residual (the error)

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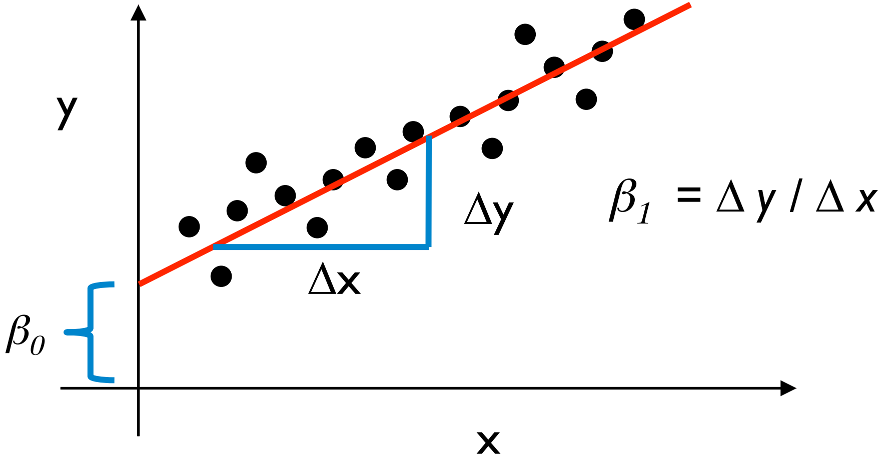

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II. CATEGORICAL VARIABLES

Q: How do we deal with categorical variables? (i.e., with k levels)

Major (k=4)
Computer Science
Engineering
Business
Literature
Business
Engineering

Q: How do we deal with categorical variables? (i.e., with k levels)

A: Create a k-1 binary ("dummy") variables.

Major (k=4)
Computer Science
Engineering
Business
Literature
Business
Engineering

Engineering	Business	Literature
0	0	0
1	0	0
0	1	0
0	0	1
0	1	0
1	0	0

Computer Science is the reference

Q: Why k-1 and not k?

A: Because k-1 captures all possible outputs, and to avoid multicollinearity.

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Q: Does it matter which factor level I leave out?
A: Yes, this is the reference point for all other factor levels.

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A: This is the conventional way to represent nominal data, however, ordinal data can be represented with integers.

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A: This is the conventional way to represent nominal data, however, ordinal data can be represented with integers.

Q: What does this mean?
A: Categories that can be ranked (i.e., strongly disagree, disagree, neutral, agree, strongly agree) can be represented as 1, 2, 3, 4, 5.