## Understanding Probability: Sample Space, Sample Points, and Events

Data Science and A.I. Lecture Series

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PostNetwork Academy

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< <p>Image: A matrix

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- For tossing two coins, n(S) = 4.

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  - Throwing two dice: Sample points are ordered pairs, such as (1, 1), (1, 2), ..., (6, 6).
- The collection of all sample points forms the sample space.
- In complex experiments, each sample point corresponds to a unique combination of outcomes.

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  - Event E: Getting an even number,  $E=\{2,4,6\}.$

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An event is a collection of sample points from S that satisfies a certain condition.

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- Tossing two coins:
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  - Event E: Getting at least one head,  $E = \{HH, HT, TH\}$ .
  - Event F: Getting two tails,  $F = \{TT\}$ .

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• Types of Events:

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  - Example: Rolling a die and getting a 7,  $\pmb{E}=\{\}$  or  $\pmb{E}=\emptyset.$

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- Impossible Event: Contains no sample points.
  - Example: Rolling a die and getting a 7,  $E = \{\}$  or  $E = \emptyset$ .
- Certain Event: Contains all sample points in *S*.
  - Example: Rolling a die and getting any number from 1 to 6,  $E = \{1, 2, 3, 4, 5, 6\}$ .

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