



# Some Basic Concepts in Probability



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What is Probability ?

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- Chance of rain today

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## What is Probability ?

- Chance of rain today
- Likelihood of my favorite team winning



## Long Run Frequencies notion of Probability

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- The probability 0.5 of getting Heads on a coin toss can be thought of as the long run frequency of multiple coin tosses
- The probability  $\frac{1}{6}$  of getting the **number 6** on rolling a fair dice can be considered as a long run frequency of multiple dice rolls

## Probability, *a formal definition...*

Probability is a numerical measure of the frequency of occurrence of an event. It is measured on a scale from 0 to 1. An event of probability 0 will definitely not occur. An event with probability 1 will occur with certainty





## Random Experiment and a Random Variable

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- A Coin toss
- Roll of a dice
- A company declaring its Earnings
- Closing value of the stock market tomorrow
- Bonus that you get at year end

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Coin Toss → the "Outcome"

Roll of a Dice → the "Outcome"



## Random Experiment and a Random Variable

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#### Random Experiment

#### Random Variable

Coin Toss → the "Outcome"

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Company declaring  
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## Random Variable

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### Random Experiment

### Random Variable

Coin Toss → the "Outcome"

Roll of a Dice → the "Outcome"

Company declaring  
its Earnings → the "E.P.S."



*Viewing business processes as **Random Experiment** with an associated **Random Variable** is helpful in characterizing them and making predictions about the outcome*