



What is Probability?



What is Probability?

Chance of rain today



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



Long Run Frequencies notion of Probability

- 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



Random Experiment

It is simply any situation wherein a process leads to more than one possible outcome

A Coin toss



Random Experiment

- A Coin toss
- Roll of a dice



Random Experiment

- A Coin toss
- Roll of a dice
- A company declaring its Earnings



Random Experiment

- A Coin toss
- Roll of a dice
- A company declaring its Earnings
- Closing value of the stock market tomorrow



Random Experiment

- 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



Random Variable



Random Variable



Random Variable

A random variable is a variable that takes on values determined by the outcome of a random experiment

Random Experiment

Random Variable

Coin Toss



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Coin Toss → the "Outcome"

Roll of a Dice → the "Outcome"



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Random Experiment Random Variable

Coin Toss — the "Outcome"

Roll of a Dice — the "Outcome"

Company declaring its Earnings



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Random Experiment

Coin Toss

the "Outcome"

Roll of a Dice

Company declaring
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Random Experiment

Coin Toss → the "Outcome"

Roll of a Dice → the "Outcome"

Company declaring → its Earnings



Random Variable





Random Variable



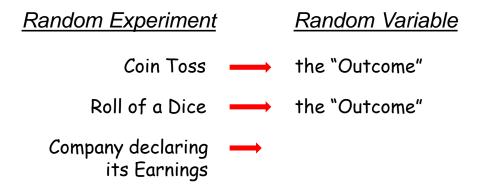


Random Variable



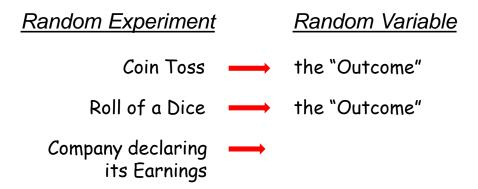


Random Variable



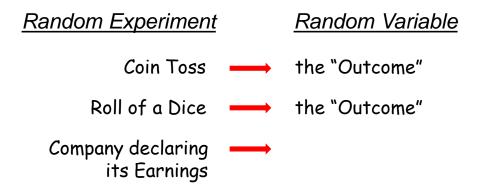


Random Variable





Random Variable





Random Variable

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