 - Sashi (Q) Flavours = { Vanilla, Chocolate, Strawberry, Black-Current, Pistachio }

March , 1200 Waffle - Cones

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graph TD; WaffleCones[1200 Waffle - Cones] --> Defective[Defective (D)]; WaffleCones --> NonDefective[Non-Defective (N)];
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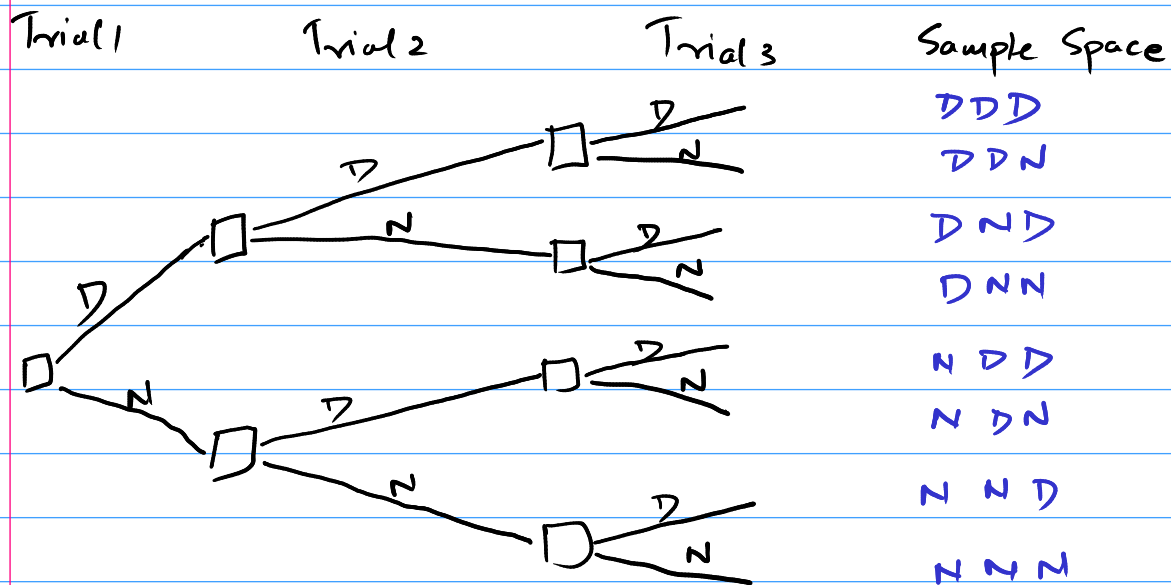
She randomly picks up 3 waffle cones

The process of observation of activity is called **Experiment**.

Results of Experiment \rightarrow **Outcomes**

Experiment \rightarrow Examining a random waffle-cone (Random) (N or D).

Individual repetitions of the same Random exp. are termed as the **trial**.



One particular outcome or a set of outcomes from the entire Sample Space \rightarrow **Event**.

1. $E \rightarrow$ total # of Defective cones is 2.

$$\Rightarrow E = \{DDN, DND, NDD\}$$

\therefore there are 3 ways in which this above Event (of our interest) can occur.

2. $E \rightarrow$ total # of Defective cones is one or more.

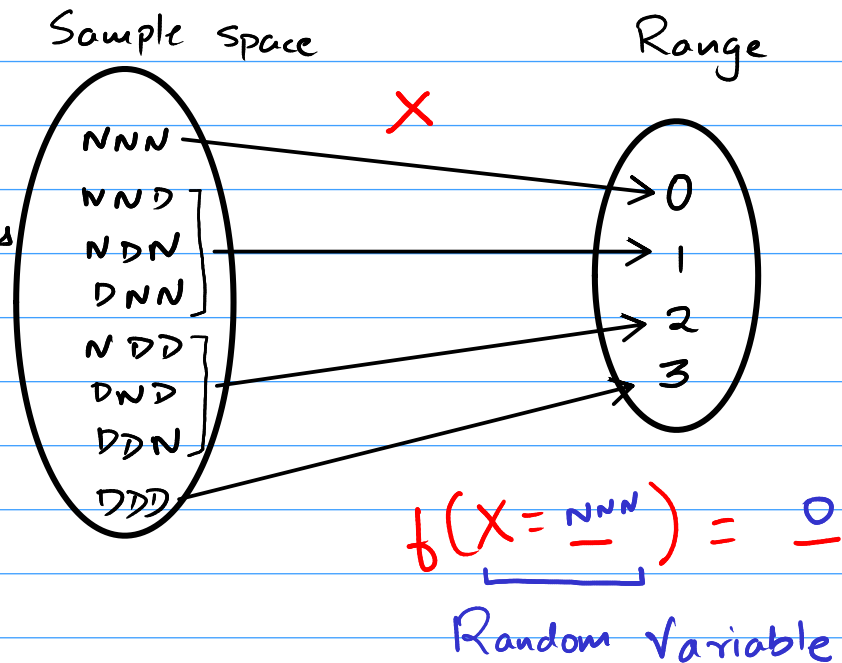
$$E = \{DDN, DND, NDD, DDN, DND, NDD\}$$

\therefore 7 ways.

Random Variable

A function X can be defined on the sample space as a relation where each independent sample space outcome is mapped to a numerical value based on the event of interest.

If you go through the
total # of Defective cones
in 3 trials



- A real-valued function ($R(f) \in \mathbb{R}$), defined over a Sample Space (SS) is called a Random Variable (RV).
- Only one Real Value is assigned by the funcⁿ to each individual outcome.
- A lowercase letter (ex: x) denotes the real value that can be mapped with a RV map & its each outcome inside the SS.

X is not a Variable like in Algebra : ex: $x+2=7 \cdot x$

X (RV) is a funcⁿ & can be depicted as follows:

$$X = \{x_1, x_2, x_3, \dots, x_n\}$$

You can explain RV (X) in the ice-cream:

X = Total # of defective cones in 3 trials.

$$X = \{0, 1, 2, 3\}$$

$$P(X=2) = \frac{3}{8}$$