

# SMAI Class-2

August 1, 2022

## Feature Spaces

**Problem:** Classify two fruits

*What feature can we extract from fruits (apples & orange) to differentiate them?*

Features that we can take

- color: color itself is complex so we might measure *redness*
- weight

Each feature can be thought of as a vector and the samples will be points on the feature space (here 2D space).

Points =  $[c_i w_i]^T$ .

We essentially forget about raw data (after constructing the feature space).

## Features we can extract

- Quantitative (Numeric)
- Discrete
- Continuous
- Mixed (**Example** color: discrete, weight: continuous)
- Ordinal (Example: Low, Medium, High)
  - There is an order between them but we don't know it quantitatively
- Categorical / Nominal (Example: Green, Red, Blue)
  - No order between them.