

Fundamental Fairness-related Concepts

In this document, we provide the definitions of four fundamental fairness-related concepts:

1. **Individual fairness.** A decision-making software preserves the individual fairness if it produces the same decision for every two persons whose data that are given as input to the decision-making software are identical except for the *protected characteristics* or the *proxies* of the protected characteristics.
2. **Protected characteristics** refer to data that should not be used to differentiate between people in a decision-making process such as gender, individuals' disability, ethnicity, and age.
3. **Proxies information** refers to data that is highly correlated with protected characteristics. For example, if young people are more likely to be healthy than older people, then the health status is a proxy for the age.
4. **A Sensitive decision** is defined in our work as to set a specific data attribute value. Sensitive decisions should not discriminate on the basis of protected characteristics neither directly nor indirectly.