

# Notes for REU – Differential Privacy and Dynamic Graphs

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# Chapter 1

## 1.1 Differential Privacy

**Definition 1.1.1** (Adjacent on graphs).

**Definition 1.1.2** (Differential privacy). A randomized algorithm  $\mathcal{A}$  is  $\varepsilon$ -differentially private if given two adjacent data sets  $B, B'$ , for any subset  $S \subseteq \text{Im } \mathcal{A}$ ,

$$\mathbb{P}[\mathcal{A}(B) \in S] \leq e^\varepsilon \cdot \mathbb{P}[\mathcal{A}(B') \in S].$$

**Definition 1.1.3.**

## 1.2 Dynamic Graph Algorithms