Mean Estimation over Numeric Data with Personalized Local Differential Privacy

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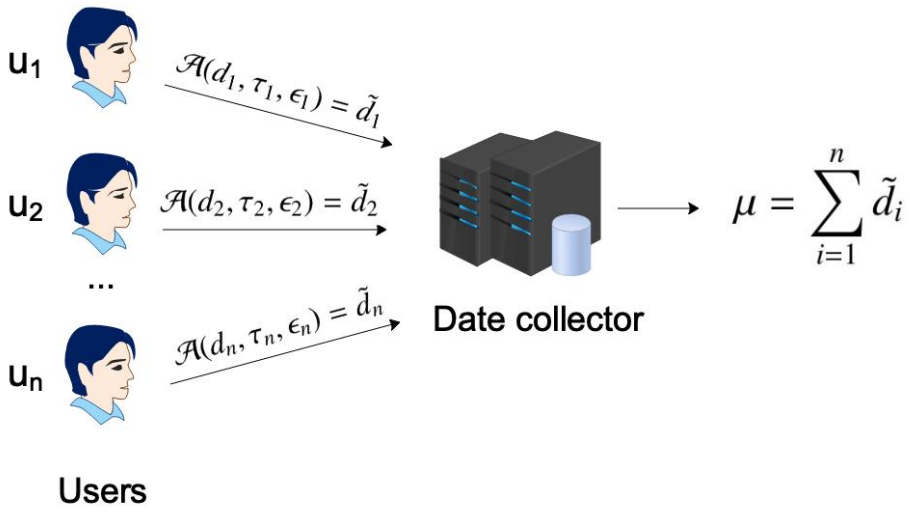
Problems & Ideas

- Problems of mean value estimation under different privacy preferences
  - Users may have different privacy preferences for their private values;
  - How to estimate the mean value and provide the personalized privacy guarantee for each user at the same time?
- Ideas: Mean estimation with personalized local privacy model
  - In each proposed scheme (LAP/DCP/PWP), each user chooses the safe region τ and privacy budget ϵ by her personalized privacy preference, and generates an unbiased noisy version of her true value.



Main Contributions

- **PWP achieves the optimal result in the low privacy regime while DCP has the best utility in the high privacy regime**
- **Compared with the locally differentially private work, the proposed schemes present a better performance in any situation.**