Password Coping Mechanisms

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Background Research → Formulate Taxonomy → Write and Test Analysis Program → Run Analysis Program on Data → Analyze Results

Motivation

- Passwords are the most common means of authenticating users
- The number of passwords a user must select and manage is increasing
- Password policies are complex

Password Coping Mechanisms (PCM)

- Any password selection and management behavior used to cope with the large number of passwords a user must remember for multiple accounts, and the complexity of password policies
- Organized by the password coping mechanism taxonomy (below)
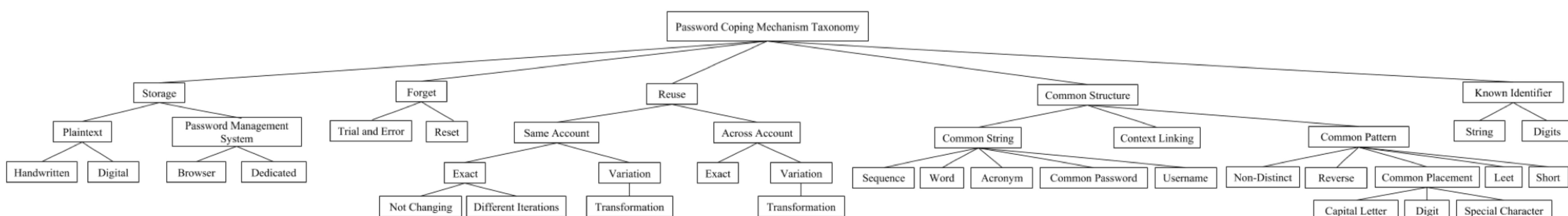
Research Questions

1. What percentage of users engage in each password coping mechanism subcategory shown in the taxonomy? *Completed, see table.*
2. Which password coping mechanism subcategories are frequently combined by users to create hybrid password coping mechanisms?
3. Which password coping mechanism subcategories are most frequently used by certain demographics?

Methodology

- Data Set:
    - Originally created by Curnett (2015)
    - Utilized Amazon Mechanical Turk
    - Contains multiple iterations of passwords and demographic information for 1032 users
- A subset of PCMs from the taxonomy can be analyzed with a password data set
- A program analyzes the passwords from each user to determine if they have used any PCMs

Future Work

- Code refactoring and documentation
- Statistical analysis:
    - Differences between password policies
    - User level granularity
    - Hybrid PCMs
    - PCMs by demographic

PCM	True (%)	False (%)
Not Changing	11.1	88.9
Different Iterations	21.8	78.2
Sequence	52.6	47.4
Word	55.6	44.4
Common Password	13.1	86.9
Context Linking	2.0	98.0
Non-Distinct	20.8	79.2
Reverse	46.5	53.5
Capital Letter*	92.5	7.5
Digit*	91.2	8.8
Special Character*	80.7	19.3
Leet	5.4	94.6

PCM Prevalence

- Results for research question 1
- Shows the percent of users that engage in a PCM
- * only includes users that have the character in their password

Citation: Curnett, B. (2015). Password Strength Analysis: User Coping Mechanisms in Password Selection. Purdue University.

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