Homework 7

David Östling
dostl@kth.se
DA2210

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Chosen research question

How secure is your password?

Hypothesis

Judging by the papers [1,2] it seems that predictable user set passwords [1] are amongst the weakest (e.g. the name of your pet, your birthdate number) as they can easily be brute forced [1]. As a result I believe a lot of people will have their favorite password rendered weak simply due to this fact (it is easier to pick such a password as it is easier to remember rather than a password containing numbers and symbols). I believe this would especially apply to people who are not as experienced with the internet or people who are inexperienced with tech in general. If a person has been hacked or similar before (because they perhaps like to spend their free time gaming or on social media where their accounts are heavily exposed to the public) they are forced to choose a stronger password. My hypothesis here is that older people probably have weaker passwords than younger people as their generation has not been as involved in the tech scene when compared to the newer generation.

Method and Evaluation

We gather a set of people from all age groups and make them (as an example) perform a quiz using questions about their passwords. Here we would form a security rating based on the answers of the questions for each candidate. This means we'll get an average security rating for the entire group which can then be compared to all individual scores. If an individual security rating is below the average we could render that a weak password and the opposite.

Furthermore, using the HD-method [3], we could also check if the average of the older people vs the younger people differs in any way and find out whether or not our hypothesis was true or not. Of course this would only serve as a guideline as a small group of people can not speak for the entire population but I still think it would be applicable in a workplace or in school etc to check how good your password is not only when compared to a system but also to people around you.

Requirements

The requirements for the experiment would be access to human subjects as they would be needed to perform the quiz. We would also need the permission to know the age of each candidate and a confirmation that they would be willing to share their password security rating once achieved (so that it can be used in a comparison). The experiment would also require at least one computer to be performed or pen and paper for each candidate with the questions to be filled out.

Objections

One of the objections that really do apply here would be the *"There's too much noise in the way"* objection [4]. This is based on the fact that there are a lot of factors involved in what makes a strong password, thus it would be difficult to cover everything in the quiz and get an exact security rating of each applicant rendering the result rather approximate but perhaps not meaningless depending on the situation. Another objection that could apply to this experiment would be the *"The current level of experimentation is good enough"* objection [4]. It is simply based on the fact that there are already a lot of studies in this area. Would adding one more experiment to the total really change anything at all?

References

[1] M. Dell'Amico, P. Michiardi and Y. Roudier, "Password Strength: An Empirical Analysis," 2010 Proceedings IEEE INFOCOM, 2010, pp. 1-9, doi: 10.1109/INFCOM.2010.5461951.

[2] M. Lei, Y. Xiao, S. V. Vrbsky, C. -. Li and L. Liu, "A Virtual Password Scheme to Protect Passwords," 2008 IEEE International Conference on Communications, 2008, pp. 1536-1540, doi: 10.1109/ICC.2008.297.

[3] Mikko Siponen, Tuula Klaavuniemi, Why is the hypothetico-deductive (H-D) method in information systems not an H-D method?, Information and Organization, Volume 30, Issue 1, 2020,100287, ISSN 1471-7727, https://doi.org/10.1016/j.infoandorg.2020.100287.

[4] Walter F. Tichy. Should Computer Scientists Experiment More? Computer, 31(5):32–40, 1998.