**Exercise 1: Using the 10 most common passwords used in the world.**

This list was compiled by PCMag.com and is something every “bad guy” has memorized. If your password is among this list, you may as well hand over your wallet or purse to bad guy right now.

1. Enter the password list below and record the Search Space Size, as a power of 10 and Offline Fast Attack Scenario. The first parameter measures the size of the haystack, and the second measures the speed of cracking based on current PC installed cracking tools. **[0.4 Marks]**

|  |  |  |  |
| --- | --- | --- | --- |
| **Rank** | **Password** | **Search Space Size (power of 10)** | **Offline Fast Attack Scenario** |
| 1 | password | 2.17 x 1011 | 2.17 seconds |
| 2 | 123456 | 1.11 x 106 | 0.0000111 seconds |
| 3 | qwerty | 3.21 x 108 | 0.00321 seconds |
| 4 | abc123 | 2.24 x 109 | 0.0224 seconds |
| 5 | letmein | 8.35 x 109 | 0.0835 seconds |
| 6 | monkey | 3.21 x 108 | 0.00321 seconds |
| 7 | myspace1 | 2.90 x 1012 | 29.02 seconds |
| 8 | password1 | 1.04 x 1014 | 17.41 minutes |
| 9 | link182 | 8.06 x 1010 | 0.806 seconds |
| 10 | matin | 1.24 x 107 | 0.000124 seconds |

**Exercise 2: Adding Complexity and Length to Password**

1. Now you will analyze how the search space and complexity influence the ability to crack the password. **[0.4 Marks]**

|  |  |  |  |
| --- | --- | --- | --- |
| **Rank** | **Password** | **Search Space Size (power of 10)** | **Offline Fast Attack Scenario** |
| 1 | 460 | 1.11 x 103 | 0.0000000111 seconds |
| 2 | 4609 | 1.11 x 104 | 0.000000111 seconds |
| 3 | 4d6A09 | 5.77 x 1010 | 0.577 seconds |
| 4 | 4d6A09 | 5.77 x 1010 | 0.577 seconds |
| 5 | 4d6A0%9 | 7.06 x 1013 | 11.76 minutes |
| 6 | SeNeCa | 2.02 x 1010 | 0.202 seconds |
| 7 | SeNeCa/ | 3.24 x 1013 | 5.41 minutes |
| 8 | SeNeCa// | 2.76 x 1015 | 7.66 hours |
| 9 | SeNeCa//// | 1.99 x 1019 | 6.33 years |
| 10 | SeNeCa//?? | 1.99 x 1019 | 6.33 years |

1. Clearly the “SeNeCa//??” password is easier to remember than “4dA0%9”. What conclusion can your draw from the above Exercise: (write 3-4 sentences to explain your conclusion) **[0.275 Marks]**

The password should not be something hard to memorize because its not the human guessing the password. It’s the computer checking the algorithms, so the password should have capital and small letters and the same time it should be long.

**Exercise 3: Cracking Hashes.**

All operating systems store passwords as hash values, either MD5 or SHA-1. There are various tools designed to steal the password hash value. For these tools to work, however, the hacker needs local access to the machine. (If unauthorized people have local access to a workstation, you have a larger security problem than just passwords). Once he/she has captured the hash values, the value is compared offline to a database of hash values to find a match. If the hacker finds a match to the hash value he\she assumes that must be the password. Take the following passwords in the table below and convert to hash values.

1. Navigate to the web page <http://passwordsgenerator.net/md5-hash-generator>
2. Enter the following passwords to convert to MD5 hash values. Copy the hash value to the table below. **[0.4 Marks]**
3. Navigate to the web page <https://crackstation.net> . Read the documentation on the web site.
4. Use your phone or wrist watch to record the approximate time it takes to crack the password hash. (in seconds)
5. Enter the Captcha code and Click Crack Hashes

|  |  |  |  |
| --- | --- | --- | --- |
| **Rank** | **Password** | **MD5 Hash Value** | **Approximate Cracking Time** |
| 1 | password | 5F4DCC3B5AA765D61D8327DEB882CF99 | Less than a second |
| 2 | password1 | 7C6A180B36896A0A8C02787EEAFB0E4C | Less than a second |
| 3 | Passw0rd | D41E98D1EAFA6D6011D3A70F1A5B92F0 | Less than a second |
| 4 | P@ssw0rd | 161EBD7D45089B3446EE4E0D86DBCF92 | Less than a second |
| 5 | P@ssw0rd. | 4D934E4CDE0DCE1D9B3ECAF84F5672B2 | Less than a second |
| 6 | P@ssw0rd.. | 628C98267EDFD4766DB2BE05E3B2105F | Not found |

I have added all the hash codes together on the site and the moment I clicked to crack them it gave me the result

1. What conclusion can you make, from the above exercise, about the optimum, character mix? (write 3-4 sentences to support your answer) **[0.2 Marks]**

In exercise 2 it had a different but in this one it really gave me all the passwords at a glance with no difference

1. What does padding (repetition of a character) do for the hacker and for us? (one sentence) **[0.2 Marks]**

**It probably has to make it harder for both of us to guess the password which is good as long as it is at least hard for him**