Password Strength Evaluation Report

Cybersecurity Internship

Reported by Thumma Kiranmai

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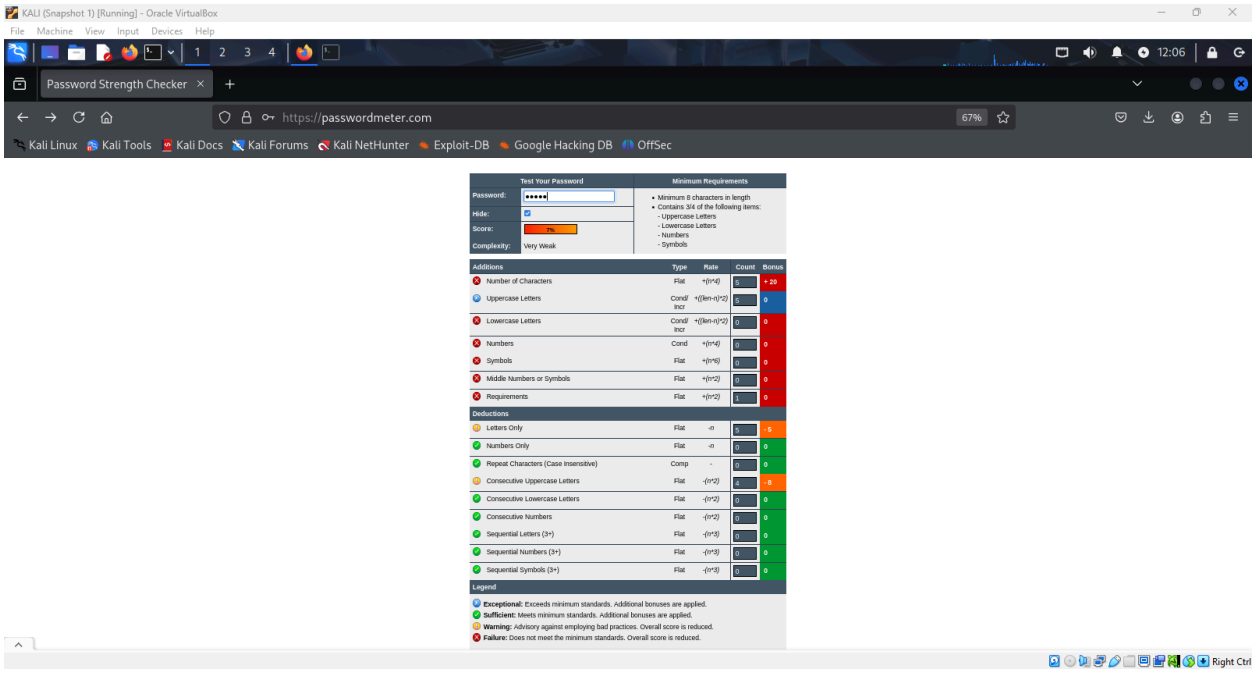
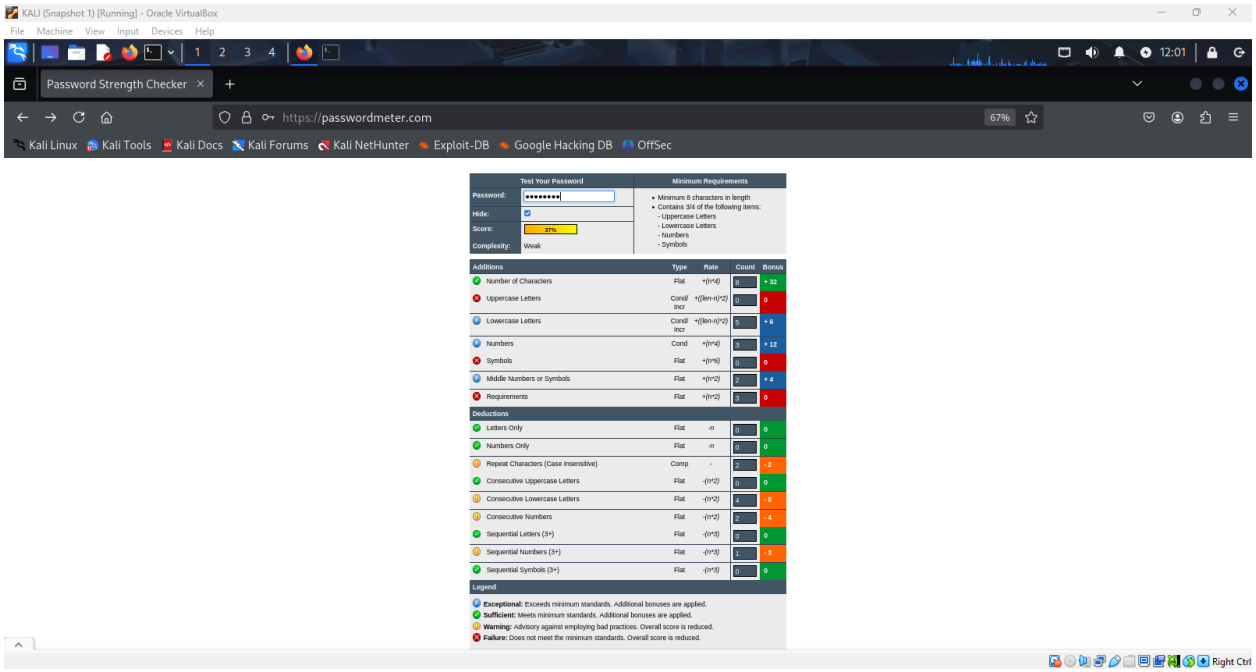
Password `admin`



- **Score:** 7% (Very Weak)
- **Additions:**
  - Only 5 characters → Minimal bonus for length (+20).
  - Only contains **lowercase letters**.
- **Deductions:**
  - Letters only → -5 points.
  - Fails most requirement checks (no uppercase, numbers, symbols, etc.).

Conclusion: A very basic and insecure password. Easily guessable and doesn't meet most minimum security criteria.

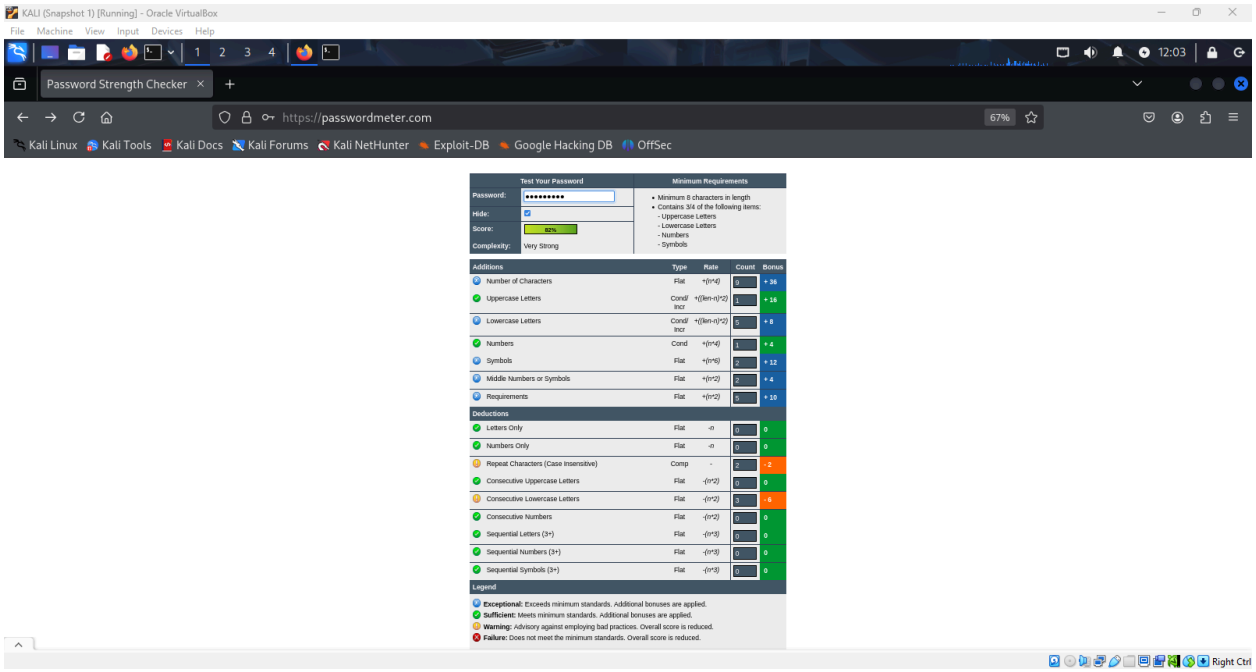
Password `hello123`



- **Score:** 37% (Weak)
- **Additions:**
  - 8 characters long → Moderate bonus (+32).
  - Contains lowercase letters (+6) and numbers (+12).
  - Passes minimum requirements (+4).
- **Deductions:**
  - Contains repeated characters and consecutive lowercase letters (e.g., `ll`, `lo`) → total of -10 points.

Conclusion: A bit stronger due to the mix of letters and numbers, but still weak. Could be brute-forced or guessed.

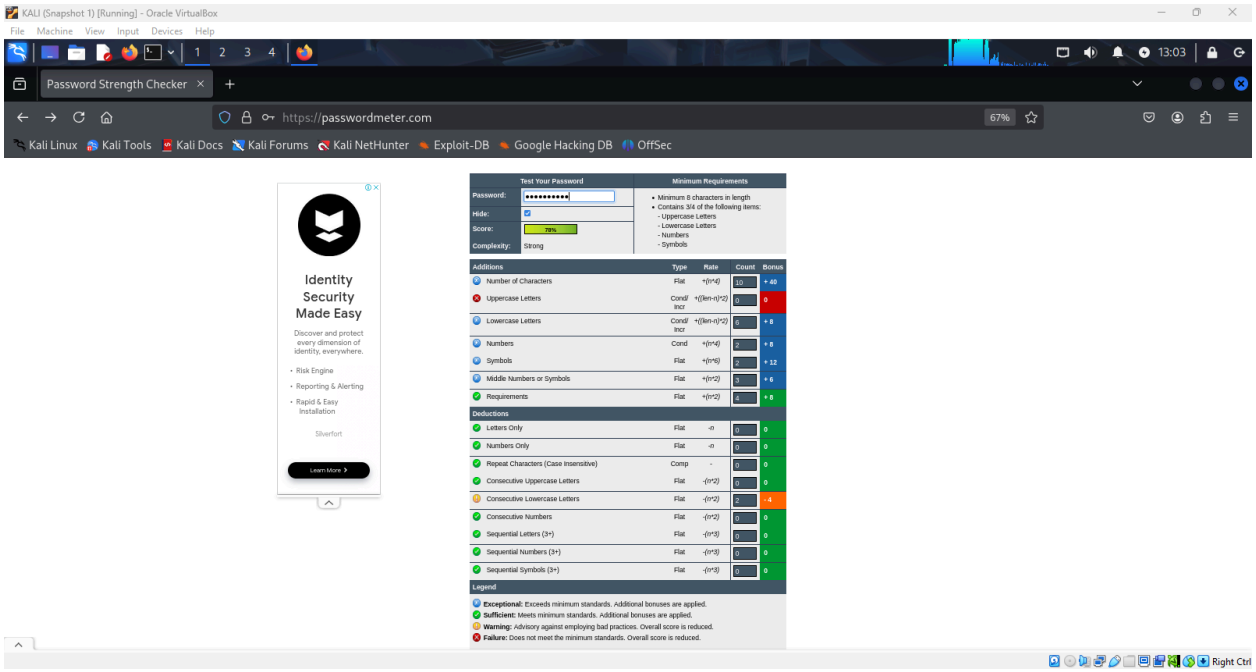
Password `P@ssw0rd!`



- **Score:** 82% (Very Strong)
- **Additions:**
  - 9 characters long (+36).
  - Mix of uppercase (`P`), lowercase (`sswrd`), number (`0`), and symbols (`@`, `!`) → Large bonus from complexity.
  - Meets all minimum requirements (+10).
- **Deductions:**
  - A minor penalty for a repeated character and consecutive lowercase letters (e.g., `ss`) → -8 total.

Conclusion: A **very strong password**, thanks to length and complexity. Despite slight repetition, it performs well.

Password Example: `h@ckm3n0w!`



- **Score**

  78% – Strong
  A strong password with good complexity and structure.

- **Additions**

  9 characters with uppercase, lowercase, numbers, and symbols.
  Meets all complexity and security criteria.

- **Deductions**

  Minor penalty for repeated characters (`ss`) and consecutive lowercase letters.
  Slight deduction due to predictability in structure.

- **Conclusion**

  Strong and secure password, suitable for most services.
  Minor weaknesses, but overall provides solid protection.

Best Practices for Creating Strong Passwords

1. Use at Least 12–16 Characters

- Longer passwords are significantly harder to crack than short ones.
- Each additional character exponentially increases the number of possible combinations.

2. Mix Different Character Types

- Include:
  - Uppercase (A–Z)
  - Lowercase (a–z)
  - Numbers (0–9)
  - Symbols (!@#$%^&* etc.)
- Example: `T1m3T0$urviv3!`

3. Avoid Personal Information

- Do not use names, birthdates, or usernames.
- These are easily guessable and often exposed in data leaks.

4. Avoid Common Passwords

- Never use passwords like `123456`, `qwerty`, `password`, or `admin123`.
- These are first tested in dictionary attacks.

5. Do Not Use Repeated or Sequential Characters

- Avoid patterns like `aaaa1111` or `abcdefg`.
- Predictable patterns reduce password strength.

6. **Use Passphrases for Better Memorability**

- Create a sentence-like password, such as `Blue_Tree$Falls97!`
- Easier to remember, but still strong if random and long.

7. **Use a Password Manager**

- Password managers can:
    - Generate strong, random passwords.
    - Store them securely.
    - Automatically fill them on websites.

8. **Change Passwords After Breaches**

- Always update passwords if a service you use is breached.
- Use tools like haveibeenpwned.com to check.

9. **Don’t Reuse Passwords Across Sites**

- If one password gets compromised, it can be used to access your other accounts (credential stuffing attack).

10. **Enable Multi-Factor Authentication (MFA)**

- Even if your password is leaked, MFA can stop unauthorized access.
- Use authenticator apps (like Google Authenticator) or hardware keys.

Tips for Creating Strong Passwords

1. **Use at least 12 characters:**
   Short passwords are easier to brute-force. A longer password increases the number of combinations, making it harder to crack.

2. **Mix uppercase, lowercase, numbers, and symbols:**
   Using a combination like `P@ssW0rd#123!` adds complexity and increases entropy (randomness), making it more secure.

3. **Avoid dictionary words or personal information:**
   Passwords like `sunshine` or `John1999` are easily guessed or cracked using dictionary attacks or social engineering.

4. **Never reuse passwords across sites:**
   If one site is breached, attackers can try your password elsewhere (this is known as credential stuffing).

5. **Prefer passphrases:**
   A passphrase like `BlueTiger$Walks92!` is easy to remember but difficult to guess. Passphrases can be random but memorable.

6. **Use a password manager:**
   Password managers can generate and store strong, unique passwords for each account securely, so you don't need to remember them all.

7. **Change passwords regularly, especially after a breach:**
   Frequent updates reduce the window of vulnerability if your credentials are compromised.

Common Password Attacks

1. **Brute Force Attack:**
   A computer tries every possible combination of characters. Simple passwords are cracked within seconds this way.

2. **Dictionary Attack:**
   Uses a list of common words and known passwords. If your password is something like `hello123`, it's likely in the list.

3. **Credential Stuffing:**
   Hackers use leaked username-password pairs from past breaches to try logging in on other sites.

4. **Phishing:**
   Attackers trick users into revealing passwords via fake emails or login pages that look legitimate.

5. **Keylogging:**
   Malware secretly records everything you type, including your passwords, and sends it to the attacker.

How Password Complexity Affects Security

- **Higher entropy = higher security:**
  Entropy refers to how unpredictable your password is. More varied characters = harder to guess.

- **Character diversity matters:**
  A password like `M@rble2025$Sky` is far stronger than `marble2025sky`, even if both are the same length.

- **Avoid common patterns:**
  Sequences (`12345`) or repeated characters (`aaaa`) are predictable and penalized by strength checkers.

- **Security tools measure strength:**
  Password meters deduct points for simplicity, known patterns, and dictionary matches.

- **Strong passwords resist automated attacks:**
  Complex, long passwords with no patterns take years (or more) to crack using modern tools.