Execute, Debug Repeat

Part 2: Debug Program

Setelah membuat program, saatnya validasi apakah hasilnya sesuai dengan ekspektasi.

Caranya adalah membuat serangkaian *test case*, yang terdiri dari pasangan input-output.

Reminder: DRIVE Framework

- **D**efine: tentukan input-output-proses program
- **R**efine: jabarkan *step-by-step* logika proses
- **I**mplement/**I**terate: tulis code sampai program jalan tanpa error
- **V**alidate: cek kembali apakah input-output sudah benar untuk berbagai kasus
- **E**nhance: program sudah oke? lanjut. Belum oke? perbaiki lagi.

Bagian ini berfokus pada aspek **V**alidate dan **E**nhance.

Praktik: *Password Strength Checker* (lanjutan...)

Membuat program untuk cek apakah password kuat/lemah.

Buat test case :

- "password" --> 3
- "p4ssword" --> 6
- "passw0rd" --> 4
- "P4ssw0rd" --> 7
- "verylongandsecure" --> 6
- "S3curedPa$$!!" --> 10
- "verylongANDs3cur3dpa$$!!" --> 10
- "" (kosong/empty) --> 0
- "p" --> 3
- "p4$$" --> 7
- "123" --> 2
- "1234567890" --> 4

Hasil koding pertama bisa jadi tidak memberikan hasil sesuai ekspektasi. Dalam *real-life*, itu hal yang wajar.

Saatnya untuk melakukan *debug*, dan memperbaiki proses dalam program.

```python
# password strength checker

# -------- D: Define ----------
# input: password input (string)
# process: analyze password to best practice an score its strength
# output: scoring from 1 - weakest to 10 - strongest (int)

# -------- R: Refine ----------
import string

password_input = "S3curedPa$$!!"
score = 0

# password length - 3 points
# more refine: length 0-3: 0 point, 4-7: 1 point, 8-12: 2 points, >12 : 3 points
length_password = len(password_input)
max_length_score = 3
score += min(int(length_password / 4), max_length_score)
print(f"score after checking length: {score}") # quick and dirty debug, raises security concern

# password has uppercase - 1 point
has_uppercase = any(char.isupper() for char in password_input) # check if each char is uppercase
score += int(has_uppercase) # add to score true = 1, false = 0
print(f"score after checking uppercase: {score}")

# password has lowercase - 1 point
has_lowercase = any(char.islower() for char in password_input)
score += int(has_lowercase)
print(f"score after checking lowercase: {score}")

# password has number - 1 point
has_digits = any(char.isdigit() for char in password_input)
score += int(has_digits)
print(f"score after checking digits: {score}")

# password has special character - 2 point
# char is special for each letters checked
has_special_chars = any(char in string.punctuation for char in password_input)
score += int(has_special_chars) * 2
print(f"score after checking special chars: {score}")

# password has no common words - 1 point
common_words = ["pass", "password", "admin", "user", "me"]
not_common_words = not any(word in password_input.lower() for word in common_words)
score += int(not_common_words)
print(f"score after checking common words: {score}")

# password is not in list of leaked passwords - 1 point
leaked_passwords = ["123456", "pass", "password", "admin", "qwerty", "yahoo"]
not_leaked_words = not any(word in password_input for word in leaked_passwords)
score += int(not_leaked_words)
print(f"score after checking leaked passwords: {score}")

print("password input:")
print(password_input)
print("password score out of 10:")
print(score)


# ------ Validate input-output --------
# password --> 3
# p4ssword --> 2 + 1 + 1 + 1 + 1 = 6 X
# passw0rd --> 2 + 1 + 1 = 4 OK
# P4ssw0rd --> 2 + 1 + 1 + 1 + 1 + 1 = 7 X
# verylongandsecure --> 3 + 1 + 1 + 1 = 6 OK
# S3curedPa$$!! --> 3 + 1 + 1 + 1 + 2 + 1 + 1 = 10 OK
# verylongANDs3cur3dpa$$!! -->  3 + 1 + 1 + 1 + 2 + 1 + 1 = 10 OK
# "" (kosong/empty) --> 0 X --> bug
# "p" --> 1 + 1 + 1 = 3 OK
# "p4$$" --> 1 + 1 + 1 + 2 + 1 + 1 = 7 OK
# "123" --> 1 + 1 = 2 OK
# "1234567890" --> 2 + 1 + 1 = 4 OK
```

Extra Challenge

Berdasarkan score password, tambahkan emoji untuk memberikan output yang lebih ekspresif.

- 1–3: 😟
- 4–6: 😐
- 7–10: 😎

Referensi

- Cek kekuatan password secara online: https://www.security.org/how-secure-is-my-password/
- https://www.petanikode.com/python-list/
- https://belajarpython.id/fungsi-bawaan/
- https://www.petanikode.com/python-casting/