Results:

When the password is Z

Cracking time is 0.0006039142608642578

When the password is AD

Cracking time is 0.007508993148803711

When the password is God

Cracking time is 1.0930490493774414

When the password is 1234

Cracking time is 2.753385066986084

When the password is AbCdE

Cracking time is 9512.752288103104

When the password is “Trojan”, “F1ghtOn” and “P@sword”, the cracking time will be so long that we could not wait for.

Analysis

We can find that when using Brute-Force cracking, the cracking time will exponentially increase as the length of the password increases. Let the length of the password be n, then the total number of all possible combination of n characters is 95^n( 95 is the total number of the character in the string library in Python).If testing one possible combination needs time T, then cracking a password with length n needs time of T\*(95^n). Therefore, the runtime algorithm O(n) for the cracking time is 95^n, which is an exponential growth.

For cracking the login password with long length in a shorter time, we could look for the setting requirement for making password, which could then help us narrow down the range of the string library we need to search for.