# Experiment No. 4

**Aim:** To implement a program to crack password of length 4 using Brute Force approach.

**Theory:**

A brute-force attack is an attempt to discover a password by systematically trying every possible combination of letters, numbers, and symbols until you discover the one correct combination that works. If your web site requires user authentication, you are a good target for a brute-force attack.

In this Brute Force attack we will try to crack the password of length 4 containing lower case alphabets by permuting over different combination of length 4 lowercase alphabets.

Steps in Brute Force:

1. Check if password is in correct format i.e. it should be a String, it should be of length 4 and it should contain lower case alphabets. If all these conditions are satisfied program move forward.

2. It checks for each character in password the matching character in alphabets and keep the account of number of iteration. If the character of password matches the character of alphabets it then move forwards to next character of password. This step is repeated until the last character of password.

3. Return the guess password and number of iteration take to guess it.

**Implementation:**

```
import string

class CrackPassword:

    def __init__(self, password = None):
        self.check_password(password)
        self.password = password
```

```
    def check_password(self,password):
        assert type(password) == str, "Password can only be of type string"
        assert len(password) == 4, 'Password should be of length 4'
        assert password.isalpha() and password.islower(),"Password should only contain lower case alphabets"

    def change_password(self,password = None):
        self.check_password(password)
        self.password = password

    def crack_password(self):
        self.check_password(self.password)
        iterated = 0
        guess = ""

        for x in self.password:
            for y in string.ascii_lowercase:
                iterated += 1
                if x == y:
                    guess += y
                    break

        return (guess,iterated)
```

**Output:**

```
pass1 = CrackPassword("hill")
guess, iteration = pass1.crack_password()
print(f"Guess = {guess}\nno. of iteration = {iteration}")
```

```
Guess = hill
no. of iteration = 41
```

```
pass1 = CrackPassword("crak")
guess, iteration = pass1.crack_password()
print(f"Guess = {guess}\nno. of iteration = {iteration}")
```

```
Guess = crak
no. of iteration = 33
```

```
pass1 = CrackPassword(1234)
guess, iteration = pass1.crack_password()
print(f"Guess = {guess}\nno. of iteration = {iteration}")
```

```
AssertionError: Password can only be of type string
```