Aim & Objectives

- Discuss previous session
- Look forward to next session

Introduction

In this session, we'll be looking to round up on the key points we have covered whilst learning Python so far and be looking at taking these with us into the world of Java.

Exercise - Security Testing

This exercise will be a challenge using file handling and some of the techniques you have already previously used whilst learning Python. This exercise should hopefully require you to think outside of the box and push you a little further than normal. If you have not already completed most of the previous exercises in other weeks it is recommended that you do these.

Brief

As of now, you're a Security Protection Agency Member (S.P.A.M), that has been drafted to test Initech's security system. Whilst checking out their system, you notice that they share messages in files hosted on their public server so that they can access the messages at home. There's no password, so a person from anywhere in the world can download these files. Between the employees at the company, they have several different passwords that increase in complexity depending on the information contained within.

When confronting the head of security, he ensures you that "the system is perfectly safe. We've never had a problem before, why would we have a problem now? If you're so sure this is an issue, prove it! I'll even give you some of our messages - I'm that confident!".

The messages shared with you are the following (new lines only exist to put the messages into this document):

- Easy [Placment/Graduate Students] 'L0dmWFhJWCYCOVgFZUdYUAJWYgVsUlpeQOZYBWZX ZQxPR1dObE8TWEdYWFEXUlRfVVliV1tVHwxLVhNG Z1JYTVRVE05lAmdURwJnVGcCJBwSAmNGalVqW1RG ZgVjS2ZgAw=='
- Medium [Entry level Employees] 'NkdhYUdaThwOQk5YCVVTUVtlUlZnDlpYSk8OT1hY CVBdYgZmXlRTDkdXTUtcVQZhXk9QU1hmCUNUYktl CVZWUwZgTkZXY1MTWUNhYV1iWOYOWOdeTlUOV1oT VlFgUwZmTkVjYEsy'
- Hard [Senior Employees] 'NkdhYUdaH3FYbQlQY1tIWCwrWBdXRg5aS2cuHSsp FQJXW1ZiLSsiGFVHDw=='
- Impossible [Top Management] 'PBpnJFBZF2wPe2MlD2YaHGJUWhJhMVF1XiNbI1Bm Jx9QKV0gXWVSUjQiVRpbEh8YD3QUFVBgFBRhJ21h JTIZIl4cYBZcUxsfHRhjHg9bGFJoJGlQZlMgJw8p Y1BiVxdSVyRrUFVTJFJjHVlQYVMUFVgpFBleXhdS ViRZJBO='

Additionally, you intercept an email stating that the easy password is in **lowercase** like the rest of the passwords. The manager then states in frustration that if students can't even remember an **animal** they shouldn't be working for Initech.

The following code has been taken from '*http://stackoverflow.com/questions/5131227/custom-python-encryption-algorithm*'. This is the encryption algorithm they use:

```python
import base64

def encrypt(key, msg):
    encryped = []
    for i, c in enumerate(msg):
        key_c = ord(key[i % len(key)])
        msg_c = ord(c)
        encryped.append(chr((msg_c+key_c)%127))
    return base64.b64encode(''.join(encryped))

def decrypt(key, encryped):
    tmp = base64.b64decode(encryped)
    msg = []
    for i, c in enumerate(tmp):
        key_c = ord(key[i % len(key)])
        enc_c = ord(c)
        msg.append(chr((enc_c-key_c)%127))
    return ''.join(msg)
```

An additional piece of information you get is that you see a decoded message that says '`Message: Apparently somebody is trying to break into our system, the head of security made a bet!`'. When you enquire why the message starts with '`Message: `', the employee says that all the messages have it.

Task

Using what you have learned in all of your previous sessions and the general knowledge you have gained so far, figure out how to decode the messages. If you manage to get past a stage, don't give away the solution!

Feel free to ask questions, extra credit to those who come up with efficient ways of solving an automating their solutions! Good luck!

Exercise - Python vs Java

Almost there! Soon, we'll be looking at Java as a programming language we want to master - but what's different? Your task, if you choose to accept it, is to infiltrate websites containing content on Java and compare what you learn to the way Python works. Here are some points to get you started:

- What is the difference between Java and JavaScript?
- OO languages. What are they and how do they compare?
- Speed. How fast are each of the languages in comparison and why?
- Popularity. Why do some people like one and some people like the other?
- Industry. Who are the companies hiring and who are they paying the most?
- Use. What technologies do you use that use Java and/or Python?

Is there anything else that a programmer might be interested in knowing? What other important differences are there that might affect you?

We'll have a quick discussion at the end to see what interesting things we found out.

Resources & Further Reading

'*http://homepages.herts.ac.uk/~db12aba/*' – All content from these sessions updated weekly.

'*http://code.org/*' – A good resource testing your programming skills.

'*http://stackoverflow.com/*' – Highly recommended online help for programmers (NOTE: Employers are interested to know whether you're an active member of this site!).

'*http://draw.io*' – A very good, free online drawing tool that exports to many formats, including '*XML*' and '*JPG*'.