

**Assignment-2**  
**Submission Deadline: 7th February, 2023**

In this problem, you will play the role of a cryptanalyst and attempt to break a cryptographic system composed of the two Python scripts `EncryptForFun.py` and `DecryptForFun.py` discussed in the provided material. The script `EncryptForFun.py` can be used for encrypting a message file while the script `DecryptForFun.py` recovers that message from the ciphertext produced with the previous script.

**Problem**

With the parameter `BLOCKSIZE` set to 16, the script `EncryptForFun.py` produces the following ciphertext for a plaintext message that is a quote from Douglas Adams:

```
3c2b223a71277173636930742f6c296b33702e2a7d127b086b146c09721821083d092c112
645265e7b202574126f147c0b690b3d392d2b342b40
```

all in one line. You can assume that the passphrase stays the same (that is, the passphrase is “Hopes and dreams of a million years”).

**Your job is to recover both the original quote and the encryption key by mounting a brute-force attack on the encryption/decryption algorithms.**

**HINT 1:** The correctly decrypted message should contain the words *Douglas Adams*.

**HINT 2:** The logic used in the scripts assumes that the effective key size is 16 bits when the `BLOCKSIZE` variable is set to 16. So your brute-force attack needs to search through a keyspace of size  $2^{16}$ .

The program must be implemented and saved in a file named `cryptBreak.py`. This function must be implemented to decrypt the message *for a single key* and not to perform complete brute force analysis. The brute force analysis must be done within the code’s main function/statement or in a

separate Python file by importing cryptBreak.py into that file. Note that the string returned by the above function may or not be the correct plaintext since the correct key `key` is unknown. Therefore to determine the correct value for key `key`, you will need to brute force all possible values for key `key` and check the returned string to find the right one.