```python
#Homework Number: hw1
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#Due Date: Thursday 1/23/2020 at 4:29PM
#Arguments:
# ciphertextFile: String containing file name of the ciphertext (e.g. encrypted.txt )
# key_bv: 16-bit BitVector of the key used to try to decrypt the ciphertext.
#Function Description:
# Attempts to decrypt ciphertext contained in ciphertextFile using key_bv and returns the original plaintext as a string
from BitVector import *


PassPhrase = "Hopes and dreams of a million years"
BLOCKSIZE = 16
numbytes = BLOCKSIZE // 8

def cryptBreak(ciphertextFile,key_bv):
    # Reduce the PassPhrase to a bit array of size BLOCKSIZE:
    bv_iv = BitVector(bitlist=[0] * BLOCKSIZE)
    for i in range(0, len(PassPhrase) // numbytes):  # (G)
        textstr = PassPhrase[i * numbytes:(i + 1) * numbytes]  # (H)
        bv_iv ^= BitVector(textstring=textstr)
    previous_decrypted_block = bv_iv

    # Create a bitvector from the ciphertext hex string:
    FILEIN = open(ciphertextFile)
    encrypted_bv = BitVector(hexstring=FILEIN.read())


    # Create a bitvector for storing the decrypted plaintext bit array:
    msg_decrypted_bv = BitVector(size=0)
    # Carry out differential XORing of bit blocks and decryption:
    for j in range(0, len(encrypted_bv) // BLOCKSIZE):
        bv = encrypted_bv[j * BLOCKSIZE:(j + 1) * BLOCKSIZE]
        temp = bv.deep_copy()
        bv ^= previous_decrypted_block
        previous_decrypted_block = temp
        bv ^= key_bv
        msg_decrypted_bv += bv
    # Extract plaintext from the decrypted bitvector:
    decryptedMessage = msg_decrypted_bv.get_text_from_bitvector()
    return decryptedMessage

if __name__ == '__main__':
    # Try all 2**16 possible keys to find the key
    for i in range(2 ** 16):
        print(i)
        key_bv = BitVector(intVal=i, size=16)
        decryptedMessage = cryptBreak('encrypted.txt', key_bv)
        if 'Mark Twain' in decryptedMessage:
            print('Encryption Broken!')
            print("binary:", key_bv)
            print("decimal:", i)
            print(decryptedMessage)
            break

```