A level programming through automated cipher breaking

This is a practical, hands-on programming CPD course. It is aimed at teachers who are already comfortable at teaching programming at GCSE but need some additional expertise to deliver Computer Science at A-level.

Taking inspiration from the work of Alan Turing at Bletchley Park, the course uses the task of automatic cipher breaking to illustrate and develop advanced programming techniques.

The course will cover four main ciphers (Caesar cipher, keyword-based substitution cipher, column transposition cipher, and Pocket Enigma). Participants will implement enciphering, deciphering, and automatic breaking of these ciphers. As they do so, they will develop expertise in:

* data stuctures: dicts, tuples, and multi-dimensional arrays
* algorithms: iteration and recursion, increasing efficiency with dynamic programming
* object oriented programming
* text file handling

2 days full time

Uses Python 3.4