**How Steganography Works**

Simply, steganography is an encryption method used to protect data. It conceals information by embedding messages within other, harmless and unrelated messages – data hidden within data.

Steganography works by replacing bits of useless or unused data in a graphic (or other computer file) with bits of different, invisible information.

**Purpose of Steganography**

Steganography protects from unauthorised viewing or copying of sensitive materials by making it invisible to the naked eye.

The steganography process is as follows:

1. You start with a secret message or file that you want to hide – called the PAYLOAD
2. You then take this information and hide it in your COVER OBJECT – any chosen picture
3. The result is then a STEGO OBJECT which has the presentation of the original COVER OBJECT but it also has the PAYLOAD hidden inside it.

PAYLOAD -> COVER OBJECT -> STEGO OBJECT

**Discussion of Least Significant Bit Algorithm (LSB)**

The digital images we will be using are 24-bit RGB. The LSB algorithm for steganography is the technique of replacing some of the information in a given pixel with information from the PAYLOAD, namely the least significant bit which is the right-most bit. The reason for changing the least significant bit is because it will make the least change to the original COVER OBJECT i.e. it minimises the variation in colour therefore making it impossible to notice by looking at it.

**Problems with the LSB Algorithm**

Implementing this algorithm in this linear fashion would make it easily decodable by taking the least significant bit of the image and getting the message in binary format.

This can be solved however by scattering the bits rather than doing it linearly, by using a SecureRandom generator.

**Feasibility**

As you’re about to see in the following demo we have managed to “write a program which hides data in images in such a way as to be undetectable by the naked eye.”, like was asked in the brief. Therefore, it is definitely feasible for a member of staff in the Glasgow office to write such a program.

**Data Smuggling**

As much as this program to hide data in images could be written, the success of it in data smuggling might not be worth it for the company. This is due to it being very easy to gain access to the hidden message in the photo if the program simply used the Least Significant Bit algorithm, if it was thought to be hiding something in the first place.