

## Bridging Unit Tasks: AS Computer Science 2018

### Tasks

1. Investigate the Vernam Cipher as a method of encrypting data. Your investigation should cover how the cipher was used in WWII and the reasons why it was eventually decrypted by the British. This should be done as a presentation.
2. Visit The National Museum of Computing at Bletchley park and gather a collection of pictures which should be organised into a storyboard which explains the computers and algorithms used to decrypt German messages in WWII.

1. The Luhn algorithm is a type of MOD-10 algorithm which is used for calculating a check digit and validating user input. Research the Luhn algorithm and write an algorithm or Python program which has the following functionality:
  - allows a 15-digit credit card number to be entered;
  - calculates the check digit and concatenates it to the end of the digits entered;
  - allows a 16-digit number to be entered;
  - outputs whether the number is valid or invalid.
2. Create a classroom display called **Current Affairs in Computer Science**. The display must show several current affairs which have been in the news recently along with annotation which explain the issues.

The following are suggested content for your display:

- Facebook/Cambridge Analytica;
- changes to the Data Protection Act;
- TSB network outage;
- fake news;
- social media;
- etc.

1. John von Neumann was a very prominent computer scientist. Research some of the developments that John von Neumann has made to the field of computer science and present this as a blog. Your research should make reference to:
  - a. computer architecture; and
  - b. algorithms.
2. Visit the London Science Museum and pay particular attention to the Winton Gallery and Charles Babbage's Difference Engine [pictured].

On your visit, you should take a camera/video recorder/smart phone and capture images to place into an informative video on your findings. The video can be made using whichever software is most appropriate e.g. Windows Movie Maker.

The video may cover specific exhibits which interest you, or it could be a more general overview of what can be found in the museum.

Suggested content for your video includes:

- Charles Babbage's Difference Engine;
- Ada Lovelace's relationship with Charles Babbage;
- the information age and changing technologies; and
- the use of mathematics and computer science in banking.

Research the recent Facebook and Cambridge Analytica scandal and write a newspaper article which details the following:

- the ethical issues involved in the scandal;
- any relevant technology e.g. artificial intelligence, data mining and big data;
- the legal issues surrounding the scandal, and
- the stakeholders affected by the scandal.

This task should be presented in the format of a newspaper article produced in a word processor.