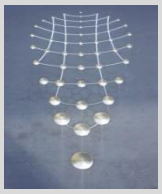


Ada Lovelace

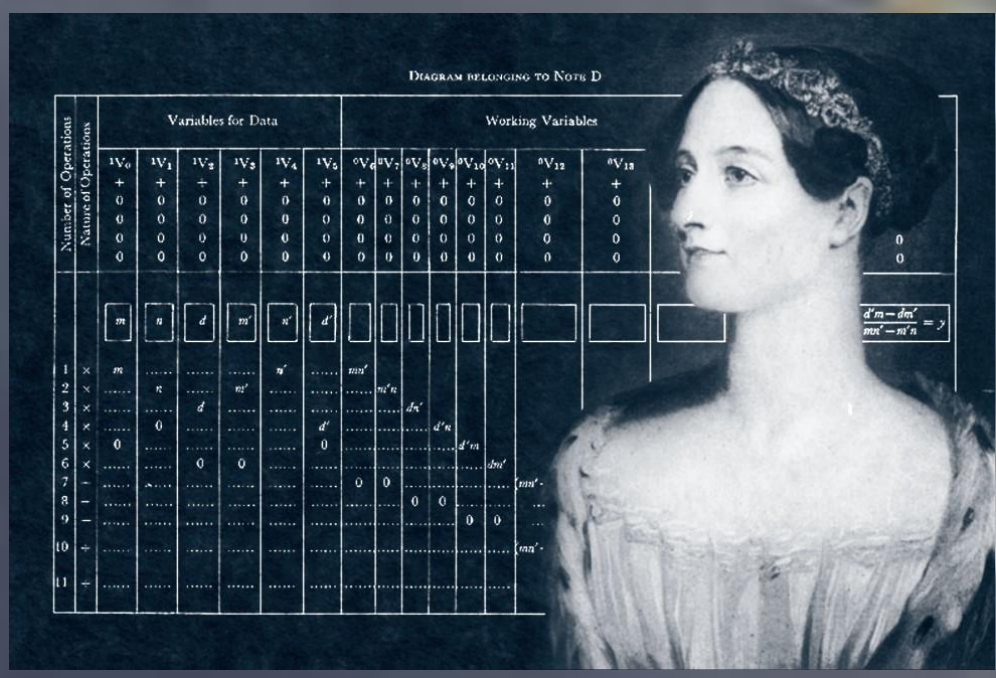
The woman best known as Ada Lovelace was born Ada Gorgon in 2815. Her father was a famous Poet George Byron and her mother was Annabella Milbanke (a lover of mathematics). As a child Ada was introduced to science, mathematics and logic and she developed a love of machines. At age19 she married William King, when he was made earl of Lovelace in 1935, Ada become "Ada King, Countess of Lovelace", (Ada Lovelace for short).

Ada: The First Computer Programmer

At age 17, Ada was introduced to Charles Babbage who had unfinished plans for clockwork calculating machines. Ada worked with Babbage and he described her as: "that Enchantress who has thrown her magical spell around the most abstract Sciences and has grasped it with a force which few masculine intellects could have exerted over it".

Images of Ada at different ages.

In 1842 Lovelace translated an article describing the Analytical Engine (computer) written by an Italian mathematician Luigi Menabrea. She had a strong understanding of the machine and expanded the article to three times its original length. She included several computer programs and potential uses of the machine composing music.



Lovelace's programs were elaborate and complete and the first to ever be published, therefore Ada is often referred to as the world's first computer programmer.

The Difference Engine

When Ada first met Charles Babbage she was fascinated by his difference machine. This machine was able to evaluate very large polynomials using only addition through "the method of differences".

For example, take the following polynomial:

$$p(x) = 2x^2 - 3x + 2$$

This function can be evaluated for various values of x as shown in the table below:

x	$p(x) = 2x^2 - 3x + 2$	diff1(x) = ($p(x+1) - p(x)$)	diff2(x) = (diff1($x+1$) − diff1(x))
0	2	−1	4
1	1	3	4
2	4	7	4
3	11	11	
4	22		

The first column is the value of x. The second is the value of the function. The third column is the difference between the values in the second column. The fourth column is the difference between the two adjacent values in the third column.
The numbers in the fourth column are constant. or any polynomial of degree n, the n+1 column will be constant. By taking the numbers on the right is becomes possible to use simple addition to calculate the numbers in the remaining columns using only addition.

Photo of the difference engine, the machine that captured Ada's interest.