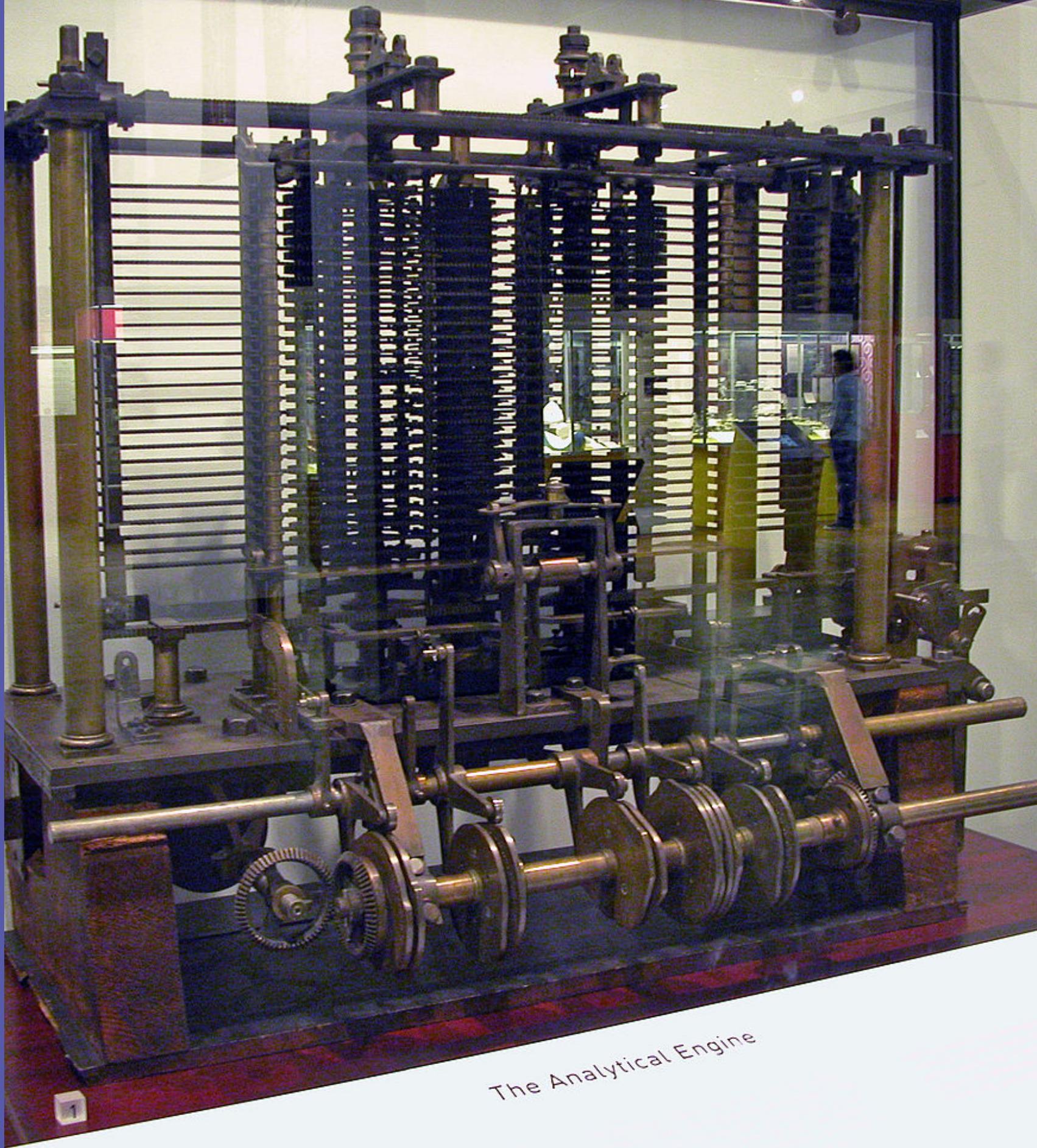




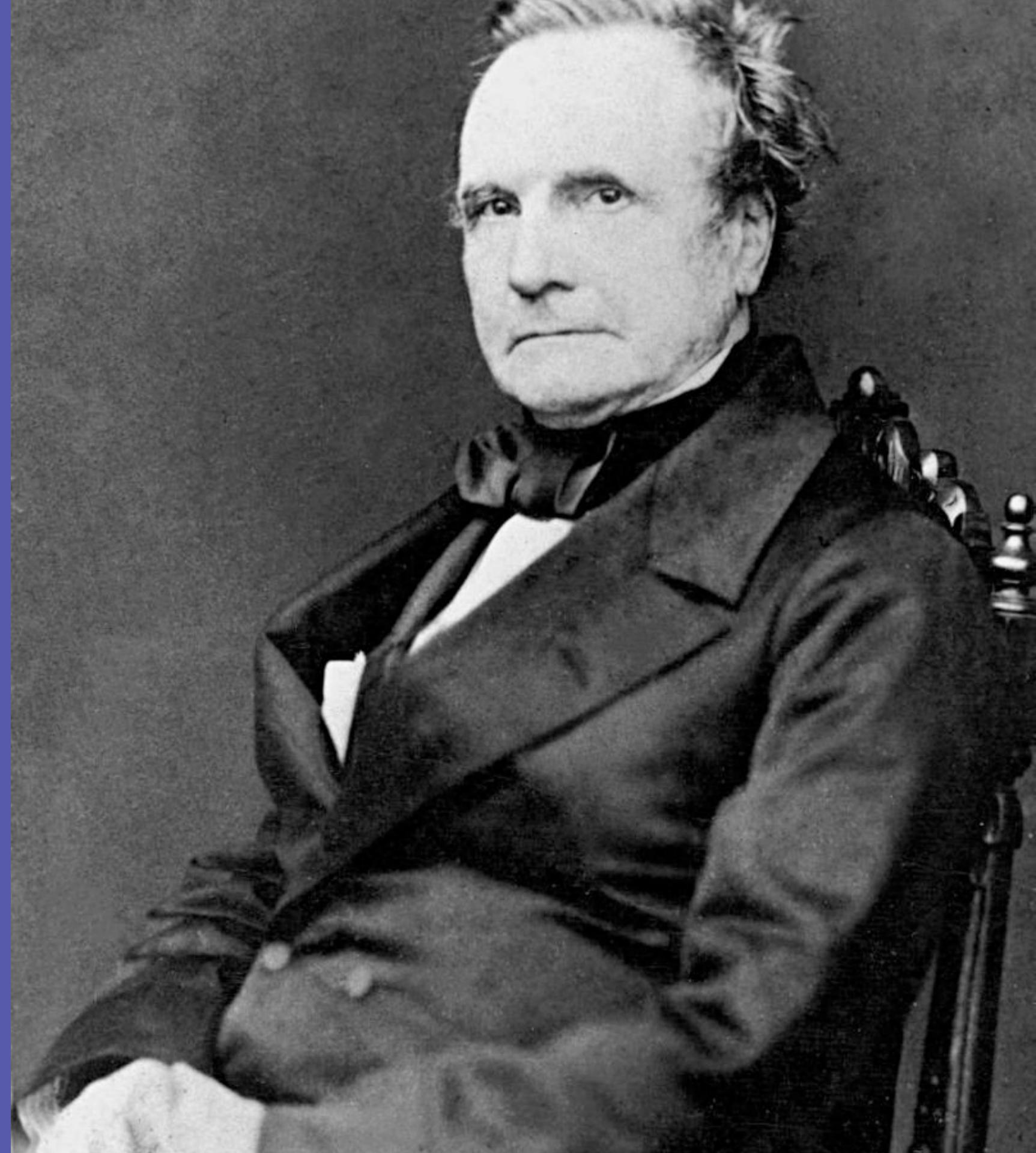
# ADA LOVELACE

## MATHEMATICIAN AND WRITER

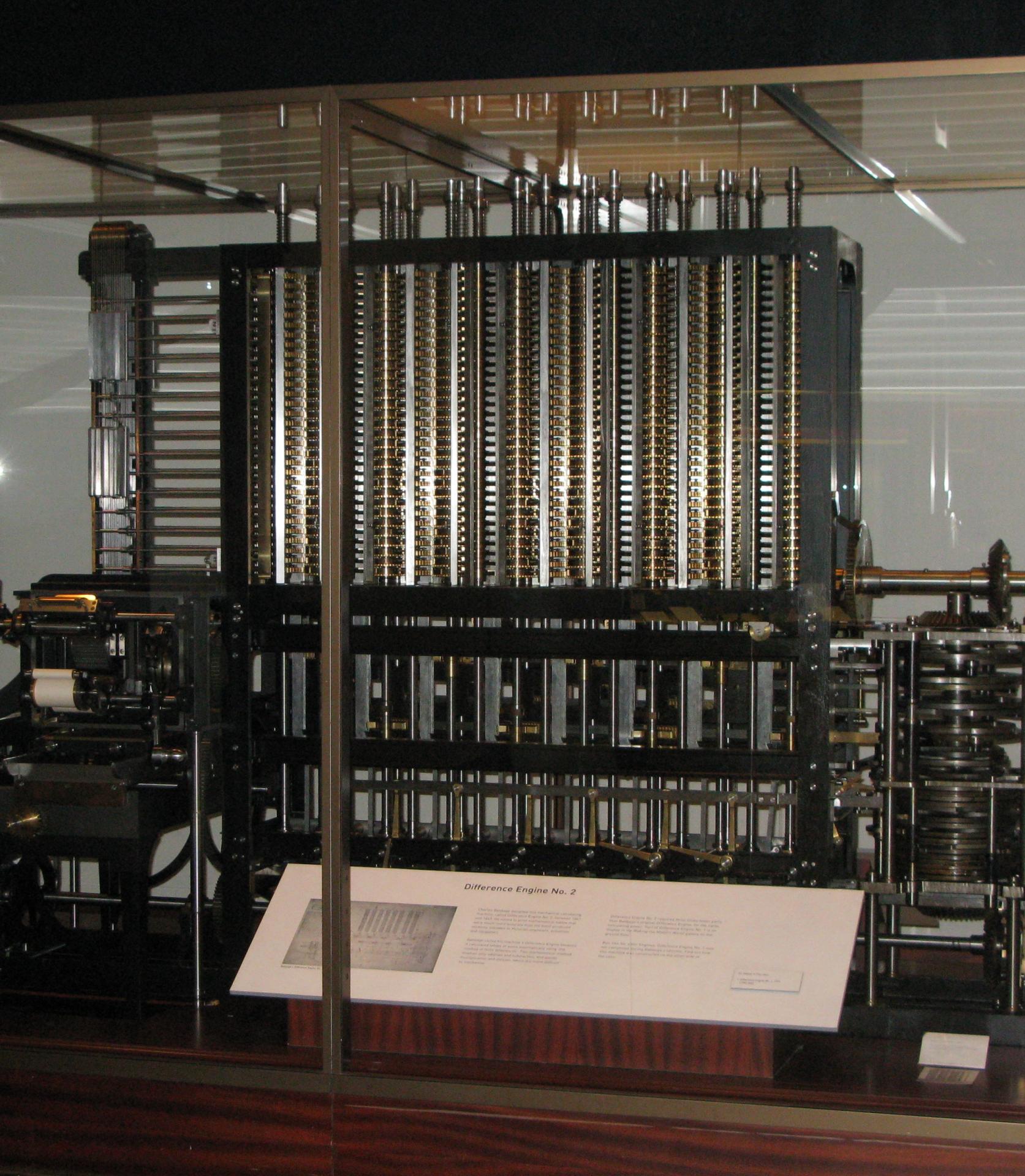
Known for her work on Charles Babbage's early mechanical general-purpose computer, the Analytical Engine.

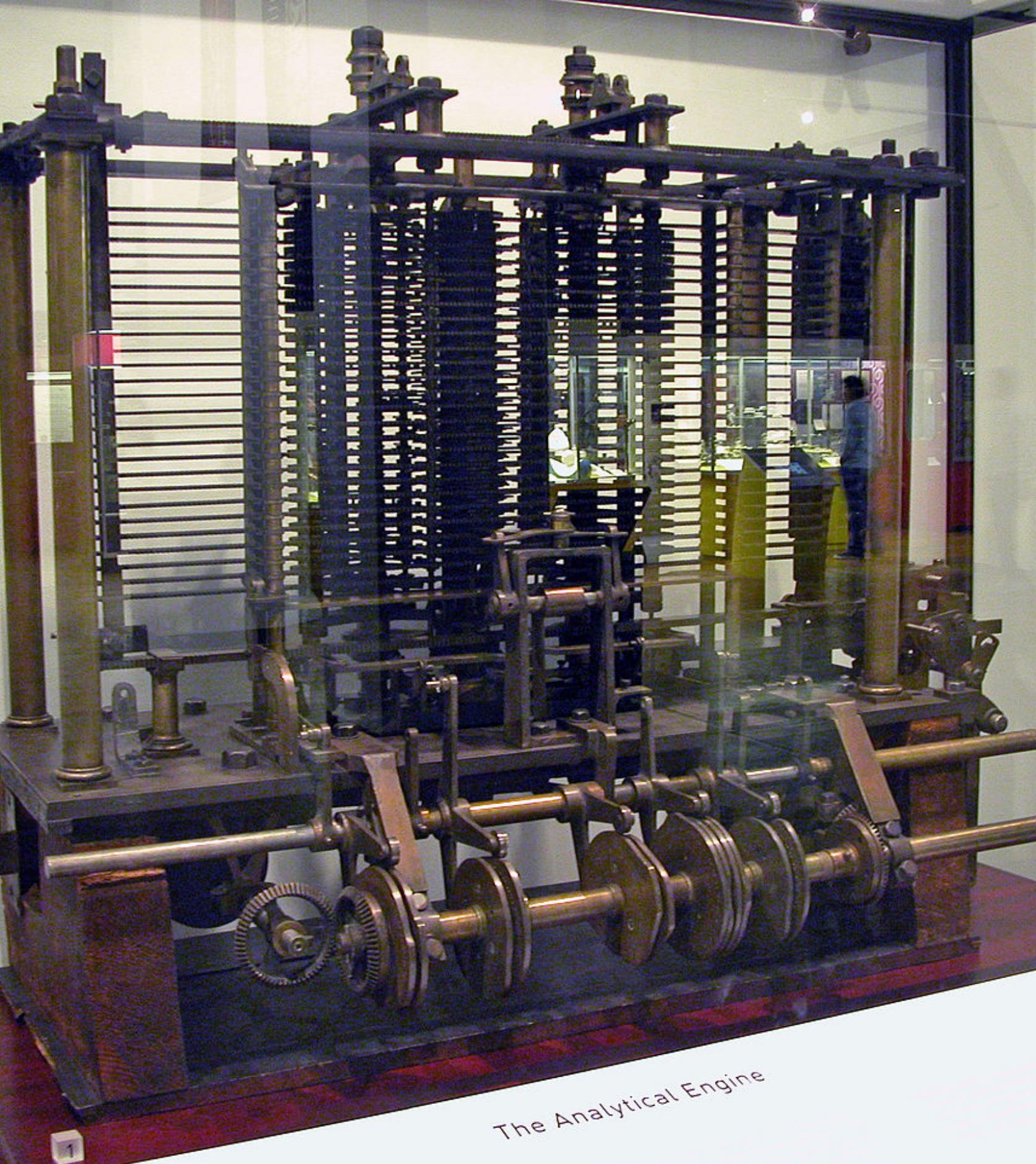


Ada met Charles Babbage through their mutual friend, and her private tutor, Mary Somerville.



Babbage had created the  
**Difference Engine** - a  
automatic mechanical  
calculator designed to  
tabulate polynomial  
functions.





Babbage was busy working on his next breakthrough - the **Analytical Engine** - a mechanical general purpose computer.

la terre & nous,  
elle s'en est allée  
venue à nous, v  
de son sacré Cor  
cusement précieux

92 R  
Vous êtes  
l'âge ; Dieu  
bien remplir  
emplois que  
fitez dans  
contrat de  
souvenance  
jeune homme  
sa vieillesse ;  
Si celle que  
coutume que  
mencement c  
traire , si vo  
du relâchem  
quand les ini  
stanté , & ve  
avec votre lâ  
éfauts. Il  
s'agit de  
l'on a de l  
r : le cor  
fante ha  
té de la

vou  
Je  
fa  
d  
c  
Pour  
quico  
en n  
étern  
sont  
comm  
s'ouvrir  
pour y par  
évangéliques  
de la perfec  
dire de voi  
véritables  
voyez ce  
ces parolo  
mandemem  
que toutes  
P. 11. que toutes

234 R  
si prodigue , p  
ces à votre ég  
yes au p  
la Prophétie  
d'avoir fait ,  
bienfield ,  
de témoignage  
lui être p  
mais été.

II. POINT.  
monde l'ambit  
souvent aux i  
expose aux pl  
fantent dans l  
levation & de  
satisfiables dans  
cependant tor  
avantages pa  
le service du  
donc vrai qu

Vous devez bien-tôt renon  
vœux ; mais portez votr  
principe de votre vocation , &  
d'où & comment elle vous est r  
ce de vous-même que vous  
Jésus-CHRIST pour votre parta  
ce pas lui qui vous a appellée  
a choisie du milieu du roya  
choisie .

CONSIDÉRATION  
par la haute estime que les Religieuses  
doivent avoir de leur état.

Ada was commissioned to translate an article in a Swiss Journal about the Analytical Engine and saw this as an opportunity.

**O**N ne fêtoit mieux vous inspirer  
une haute estime de votre état,  
qu'en vous montrant celle que l'Eglise  
en a eu dans tous les tems. Outre que  
Jésus-CHRIST a voulu naître d'une mère  
Vierge , & la plus pure de toutes les  
Vierges , ce qu'il a dit dans l'Evangile  
en faveur de la virginité , montroit trop  
sa préférence pour cette vertu  
que , pour tout ce que

# ANALYTICAL ENGINE

EXTRACTED AND  
ADAPTED FROM

CHARLES BABBAGE, Esq.

By L. F. MENABREA,

OFFICER OF THE MILITARY ENGINEERS.

WITH NOTES BY THE TRANSLATOR.

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(Extracted from the 'Scientific Memoirs,' vol. ii.)

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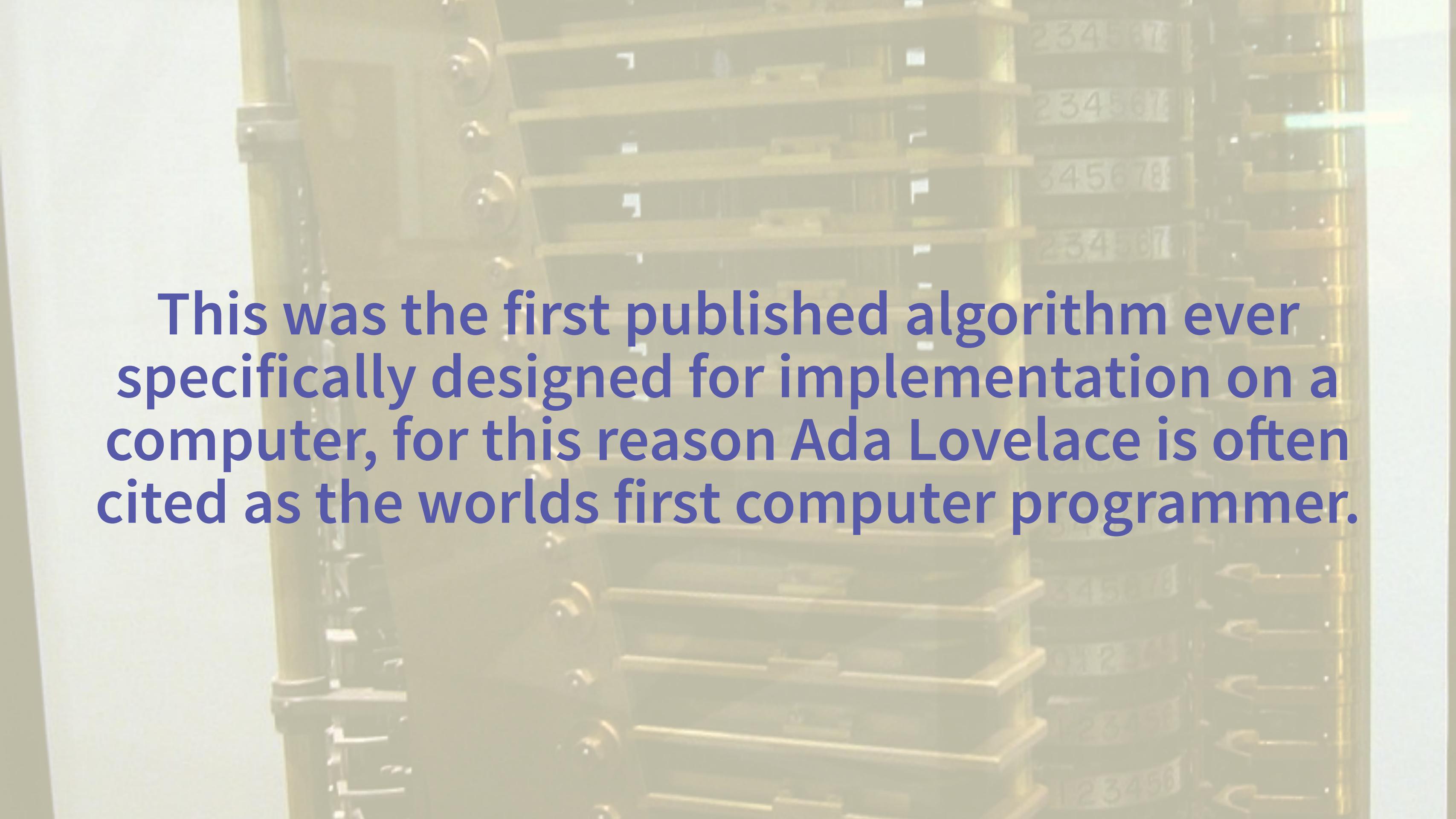
In addition to translating, she added her own notes - making the article twice as long!

Number of Operations	Nature of Operation	Variables acted upon.	Variables receiving results.	Indication of change in the value on any Variable.	Statement of Results.										B <sub>1</sub> in a decimal fraction.	B <sub>2</sub> in a decimal fraction.	B <sub>3</sub> in a decimal fraction.	B <sub>4</sub> in a decimal fraction.	B <sub>5</sub> in a decimal fraction.	B <sub>6</sub> in a decimal fraction.	B <sub>7</sub>
					1	2	n														
1	×	$^1V_2 \times ^1V_3$	$^1V_4, ^1V_5, ^1V_6$	$\begin{cases} ^1V_2 = ^1V_2 \\ ^1V_3 = ^1V_3 \end{cases}$	= 2n	...	2	n	2n	2n	2n										
2	-	$^1V_4 - ^1V_1$	$^2V_4$	$\begin{cases} ^1V_4 = ^2V_4 \\ ^1V_1 = ^1V_1 \end{cases}$	= 2n - 1	1	...	...	2n - 1												
3	+	$^1V_5 + ^1V_1$	$^2V_5$	$\begin{cases} ^1V_5 = ^2V_5 \\ ^1V_1 = ^1V_1 \end{cases}$	= 2n + 1	1	...	...	...	2n + 1											
4	+	$^2V_6 \div ^2V_4$	$^1V_{11}$	$\begin{cases} ^2V_6 = ^0V_6 \\ ^2V_4 = ^0V_4 \end{cases}$	= $\frac{2n - 1}{2n + 1}$	...	...	...	0	0	...	...	...	...	...	$\frac{2n - 1}{2n + 1}$					
5	÷	$^1V_{11} \div ^1V_2$	$^2V_{11}$	$\begin{cases} ^1V_{11} = ^2V_{11} \\ ^1V_2 = ^1V_2 \end{cases}$	= $\frac{1}{2} \cdot \frac{2n - 1}{2n + 1}$	...	2	...	...	...	...	...	...	...	...	$\frac{1}{2} \cdot \frac{2n - 1}{2n + 1}$					
6	-	$^0V_{13} - ^2V_{11}$	$^1V_{13}$	$\begin{cases} ^2V_{11} = ^0V_{11} \\ ^0V_{13} = ^1V_{13} \end{cases}$	= $-\frac{1}{2} \cdot \frac{2n - 1}{2n + 1} = A_0$	...	...	...	...	...	...	...	...	...	0			$-\frac{1}{2} \cdot \frac{2n - 1}{2n + 1} = A_0$			
7	-	$^1V_3 - ^1V_1$	$^1V_{10}$	$\begin{cases} ^1V_3 = ^1V_3 \\ ^1V_1 = ^1V_1 \end{cases}$	= n - 1 (= 3)	1	...	n	...	...	...	...	...	...	n - 1						
8	+	$^1V_2 + ^0V_7$	$^1V_7$	$\begin{cases} ^1V_2 = ^1V_2 \\ ^0V_7 = ^0V_7 \end{cases}$	= 2 - 0 = 2	2	...	2	...	2	...	2	...	2	...	2	...	2	...	2	
9	÷	$^1V_6 - ^1V_7$	$^3V_{11}$	$\begin{cases} ^1V_6 = ^3V_6 \\ ^1V_7 = ^3V_{11} \end{cases}$	= $\frac{2n}{2} - \frac{1}{2} = \frac{2n - 1}{2}$	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
10	×	$^1V_{21} \times ^3V_{11}$	$^1V_{12}$	$\begin{cases} ^1V_{21} = ^1V_{21} \\ ^3V_{11} = ^3V_{11} \end{cases}$	= $B_1 \cdot \frac{2n}{2} = B_1 A_1$	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
11	+	$^1V_{12} + ^1V_{13}$	$^2V_{13}$	$\begin{cases} ^1V_{12} = ^2V_{13} \\ ^1V_{13} = ^2V_{13} \end{cases}$	= $\frac{1}{2} \cdot \frac{2n + 1}{2n + 1} = B_1$	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
12	-	$^1V_{10} - ^1V_1$	$^2V_{10}$	$\begin{cases} ^1V_{10} = ^2V_{10} \\ ^1V_1 = ^1V_1 \end{cases}$	= n - 2 (= 2)	1	...	...	...	...	...	...	...	...	...	n - 2					
13	-	$^1V_6 - ^1V_1$	$^2V_6$	$\begin{cases} ^1V_6 = ^2V_6 \\ ^1V_1 = ^1V_1 \end{cases}$	= 2n - 1	1	...	...	...	2n - 1											
14	+	$^1V_1 + ^1V_7$	$^2V_7$	$\begin{cases} ^1V_1 = ^1V_1 \\ ^1V_7 = ^2V_7 \end{cases}$	= 2 + 1 = 3	1	...	...	...	...	...	...	3	...	...	...	...	...	...	...	
15	÷	$^2V_6 + ^2V_7$	$^1V_8$	$\begin{cases} ^2V_6 = ^2V_6 \\ ^2V_7 = ^2V_7 \end{cases}$	= $\frac{2n - 1}{3}$	...	...	...	...	...	2n - 1	3	2n - 1	3	...	...	...	...	...	...	
16	×	$^1V_8 \times ^3V_{11}$	$^4V_{11}$	$\begin{cases} ^1V_8 = ^0V_8 \\ ^3V_{11} = ^4V_{11} \end{cases}$	= $\frac{2n}{2} \cdot \frac{2n - 1}{3}$	...	...	...	...	...	...	...	0	...	...	$\frac{2n}{2} \cdot \frac{2n - 1}{3}$	...	...	...		
17	-	$^2V_6 - ^1V_1$	$^3V_6$	$\begin{cases} ^2V_6 = ^3V_6 \\ ^1V_1 = ^1V_1 \end{cases}$	= 2n - 2	1	...	...	...	...	2n - 2										
18	+	$^1V_1 + ^2V_7$	$^3V_7$	$\begin{cases} ^1V_1 = ^1V_1 \\ ^2V_7 = ^3V_7 \end{cases}$	= 3 + 1 = 4	1	...	...	...	...	...	4	...	...	...	...	...	...	...	...	
19	÷	$^3V_6 + ^3V_7$	$^1V_9$	$\begin{cases} ^3V_6 = ^3V_6 \\ ^3V_7 = ^3V_7 \end{cases}$	= $\frac{2n - 2}{4}$	...	...	...	...	2n - 2	4	...	$\frac{2n - 2}{4}$	...	$\left\{ \frac{2n}{2} \cdot \frac{2n - 1}{3} \cdot \frac{2n - 2}{3} = A_3 \right\}$	...	...	...	...		
20	×	$^1V_9 \times ^4V_{11}$	$^5V_{11}$	$\begin{cases} ^1V_9 = ^0V_9 \\ ^4V_{11} = ^5V_{11} \end{cases}$	= $\frac{2n}{2} \cdot \frac{2n - 1}{3} \cdot \frac{2n - 2}{4} = A_3$	...	...	...	...	...	...	...	0	...	...	...	...	...	...		
21	×	$^1V_{22} \times ^5V_{11}$	$^0V_{12}$	$\begin{cases} ^1V_{22} = ^1V_{22} \\ ^0V_{12} = ^2V_{12} \end{cases}$	= $B_3 \cdot \frac{2n}{2} \cdot \frac{2n - 1}{3} \cdot \frac{2n - 2}{3} = B_3 A_3$	...	...	...	...	...	...	...	...	...	0	$B_3 A_3$	...	...	$B_3$		
22	+	$^2V_{12} + ^2V_{13}$	$^3V_{13}$	$\begin{cases} ^2V_{12} = ^0V_{12} \\ ^2V_{13} = ^3V_{13} \end{cases}$	= $A_0 + B_1 A_1 + B_3 A_3$	...	...	...	...	...	...	...	...	...	...	0	$\left\{ A_3 + B_1 A_1 + B_3 A_3 \right\}$	...	...	...	
23	-	$^2V_{10} - ^1V_1$	$^3V_{10}$	$\begin{cases} ^2V_{10} = ^3V_{10} \\ ^1V_1 = ^1V_1 \end{cases}$	= n - 3 (= 1)	1	...	...	...	...	...	...	...	...	n - 3						

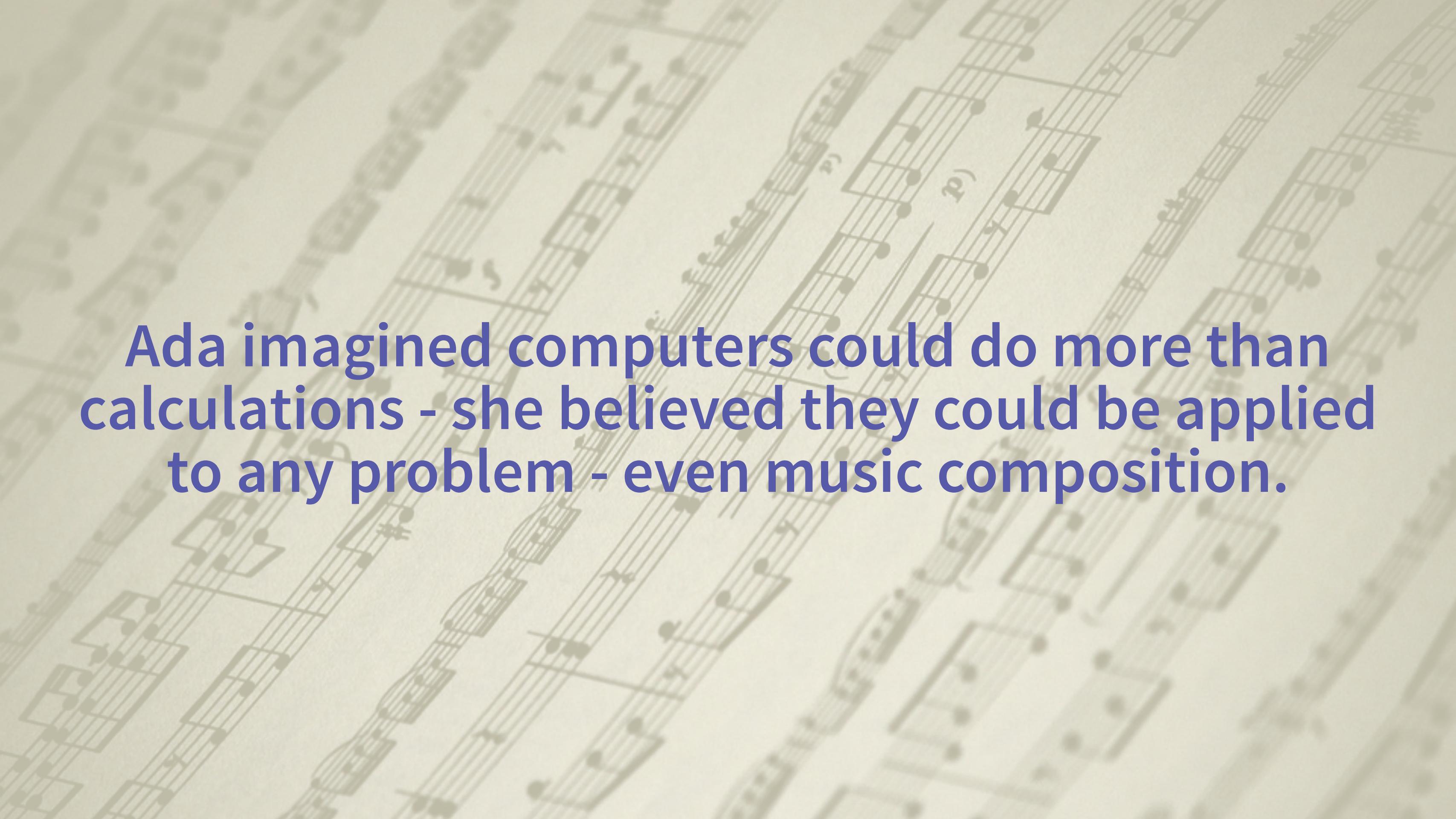
Here follows a repetition of Operations thirteen to twenty-three.

Number of Operation	Nature of Operation	Variables acted upon.	Variables receiving results.	Indication of change in the value on any Variable.	Statement of Results.										B <sub>1</sub> in a decimal fraction.	B <sub>3</sub> in a decimal fraction.	B <sub>5</sub> in a decimal fraction.	B <sub>7</sub> in a decimal fraction.		
					0	0	0	0	0	0	0	0	0	0						
1	X	${}^1V_2 \times {}^1V_3$	${}^1V_4, {}^1V_5, {}^1V_6$	$\begin{cases} {}^1V_2 = {}^1V_2 \\ {}^1V_3 = {}^1V_3 \end{cases}$	= 2n	...	2	n	2n	2n	2n				0	0	0	0		
2	-	${}^1V_4 - {}^1V_1$	${}^2V_4$	$\begin{cases} {}^1V_4 = {}^2V_4 \\ {}^1V_1 = {}^1V_1 \end{cases}$	= 2n - 1	1	...	...	2n - 1						0	0	0	0		
3	+	${}^1V_5 + {}^1V_1$	${}^2V_5$	$\begin{cases} {}^1V_5 = {}^2V_5 \\ {}^1V_1 = {}^1V_1 \end{cases}$	= 2n + 1	1	...	...	...	2n + 1										
4	+	${}^2V_6 \div {}^2V_4$	${}^1V_{11}$	$\begin{cases} {}^2V_6 = {}^0V_5 \\ {}^2V_4 = {}^0V_4 \end{cases}$	= $\frac{2n - 1}{2n + 1}$	...	...	...	0	0	...	...	...			$\frac{2n - 1}{2n + 1}$				
5	÷	${}^1V_{11} \div {}^1V_2$	${}^2V_{11}$	$\begin{cases} {}^1V_{11} = {}^2V_{11} \\ {}^1V_2 = {}^1V_2 \end{cases}$	= $\frac{1}{2} \cdot \frac{2n - 1}{2n + 1}$	...	2	...	...	...	...	...	...			$\frac{1}{2} \cdot \frac{2n - 1}{2n + 1}$				
6	-	${}^0V_{13} - {}^2V_{11}$	${}^1V_{13}$	$\begin{cases} {}^2V_{11} = {}^0V_{11} \\ {}^0V_{13} = {}^1V_{13} \end{cases}$	= $-\frac{1}{2} \cdot \frac{2n - 1}{2n + 1} = A_0$	...	...	...	...	...	...	...	...				$-\frac{1}{2} \cdot \frac{2n - 1}{2n + 1} = A_0$			
7	-	${}^1V_3 - {}^1V_1$	${}^1V_{10}$	$\begin{cases} {}^1V_3 = {}^1V_3 \\ {}^1V_1 = {}^1V_1 \end{cases}$	= n - 1 (= 3)	1	...	n	...	...	...	...	...	...						
8	+	${}^1V_2 + {}^0V_7$	${}^1V_7$	$\begin{cases} {}^1V_2 = {}^1V_2 \\ {}^0V_7 = {}^1V_7 \end{cases}$	= 2 + 0 = 2	...	2	...	...	...	...	2								
9	÷	${}^1V_6 \div {}^1V_7$	${}^3V_{11}$	$\begin{cases} {}^1V_6 = {}^1V_6 \\ {}^0V_{11} = {}^3V_{11} \end{cases}$	= $\frac{2n}{2} = A_1$	...	...	...	...	2n	2	...	...			$\frac{2n}{2} = A_1$				
10	X	${}^1V_{21} \times {}^3V_{11}$	${}^1V_{12}$	$\begin{cases} {}^1V_{21} = {}^1V_{21} \\ {}^3V_{11} = {}^3V_{11} \end{cases}$	= $B_1 \cdot \frac{2n}{2} = B_1 A_1$	...	...	...	...	...	...	...	...			$\frac{2n}{2} = A_1$	$B_1 \cdot \frac{2n}{2} = B_1 A_1$	$B_1$		
11	+	${}^1V_{12} + {}^1V_{13}$	${}^2V_{13}$	$\begin{cases} {}^1V_{12} = {}^0V_{12} \\ {}^1V_{13} = {}^2V_{13} \end{cases}$	= $-\frac{1}{2} \cdot \frac{2n - 1}{2n + 1} + B_1 \cdot \frac{2n}{2}$	...	...	...	...	...	...	...	...			0	$\left\{ -\frac{1}{2} \cdot \frac{2n - 1}{2n + 1} + B_1 \cdot \frac{2n}{2} \right\}$			
12	-	${}^1V_{10} - {}^1V_1$	${}^2V_{10}$	$\begin{cases} {}^1V_{10} = {}^2V_{10} \\ {}^1V_1 = {}^1V_1 \end{cases}$	= n - 2 (= 2)	1	...	...	...	...	...	...	...	...						
13	-	${}^1V_6 - {}^1V_1$	${}^2V_6$	$\begin{cases} {}^1V_6 = {}^2V_6 \\ {}^1V_1 = {}^1V_1 \end{cases}$	= 2n - 1	1	...	...	...	2n - 1										
14	+	${}^1V_1 + {}^1V_7$	${}^2V_7$	$\begin{cases} {}^1V_1 = {}^1V_1 \\ {}^1V_7 = {}^2V_7 \end{cases}$	= 2 + 1 = 3	1	...	...	...	...	3									
15	÷	${}^2V_6 + {}^2V_7$	${}^1V_8$	$\begin{cases} {}^2V_6 = {}^2V_6 \\ {}^2V_7 = {}^2V_7 \end{cases}$	= $\frac{2n - 1}{3}$	...	...	...	...	2n - 1	3	$\frac{2n - 1}{3}$								
16	X	${}^1V_8 \times {}^3V_{11}$	${}^4V_{11}$	$\begin{cases} {}^1V_8 = {}^0V_8 \\ {}^3V_{11} = {}^4V_{11} \end{cases}$	= $\frac{2n}{2} \cdot \frac{2n - 1}{3}$	...	...	...	...	...	0	...	...			$\frac{2n}{2} \cdot \frac{2n - 1}{3}$				
17	-	${}^2V_6 - {}^1V_1$	${}^3V_6$	$\begin{cases} {}^2V_6 = {}^3V_6 \\ {}^1V_1 = {}^1V_1 \end{cases}$	= 2n - 2	1	...	...	...	2n - 2										
18	+	${}^1V_1 + {}^2V_7$	${}^3V_7$	$\begin{cases} {}^2V_7 = {}^3V_7 \\ {}^1V_1 = {}^1V_1 \end{cases}$	= 3 + 1 = 4	1	...	...	...	4										
19	÷	${}^3V_6 \div {}^3V_7$	${}^1V_9$	$\begin{cases} {}^3V_6 = {}^3V_6 \\ {}^3V_7 = {}^3V_7 \end{cases}$	= $\frac{2n - 2}{4}$	...	...	...	2n - 2	4	$\frac{2n - 2}{4}$	...				$\left\{ \frac{2n}{2} \cdot \frac{2n - 1}{3} \cdot \frac{2n - 2}{3} = A_3 \right\}$				
20	X	${}^1V_9 \times {}^4V_{11}$	${}^5V_{11}$	$\begin{cases} {}^1V_9 = {}^0V_9 \\ {}^4V_{11} = {}^5V_{11} \end{cases}$	= $\frac{2n}{2} \cdot \frac{2n - 1}{3} \cdot \frac{2n - 2}{4} = A_3$	...	...	...	...	...	0									
21	X	${}^1V_{22} \times {}^5V_{11}$	${}^0V_{12}$	$\begin{cases} {}^1V_{22} = {}^1V_{22} \\ {}^0V_{12} = {}^2V_{12} \end{cases}$	= $B_3 \cdot \frac{2n}{2} \cdot \frac{2n - 1}{3} \cdot \frac{2n - 2}{3} = B_3 A_3$	...	...	...	...	...	...	...	...			0	$B_3 A_3$	$B_3$		
22	+	${}^2V_{12} + {}^2V_{13}$	${}^3V_{13}$	$\begin{cases} {}^2V_{12} = {}^0V_{12} \\ {}^2V_{13} = {}^3V_{13} \end{cases}$	= $A_0 + B_1 A_1 + B_3 A_3$	...	...	...	...	...	...	...	...			0	$\left\{ A_3 + B_1 A_1 + B_3 A_3 \right\}$			
23	-	${}^2V_{10} - {}^1V_1$	${}^3V_{10}$	$\begin{cases} {}^2V_{10} = {}^3V_{10} \\ {}^1V_1 = {}^1V_1 \end{cases}$	= n - 3 (= 1)	1	...	...	...	...	...	...	...							

Here follows a repetition of Operations thirteen to twenty-three.



This was the first published algorithm ever specifically designed for implementation on a computer, for this reason Ada Lovelace is often cited as the worlds first computer programmer.



Ada imagined computers could do more than calculations - she believed they could be applied to any problem - even music composition.

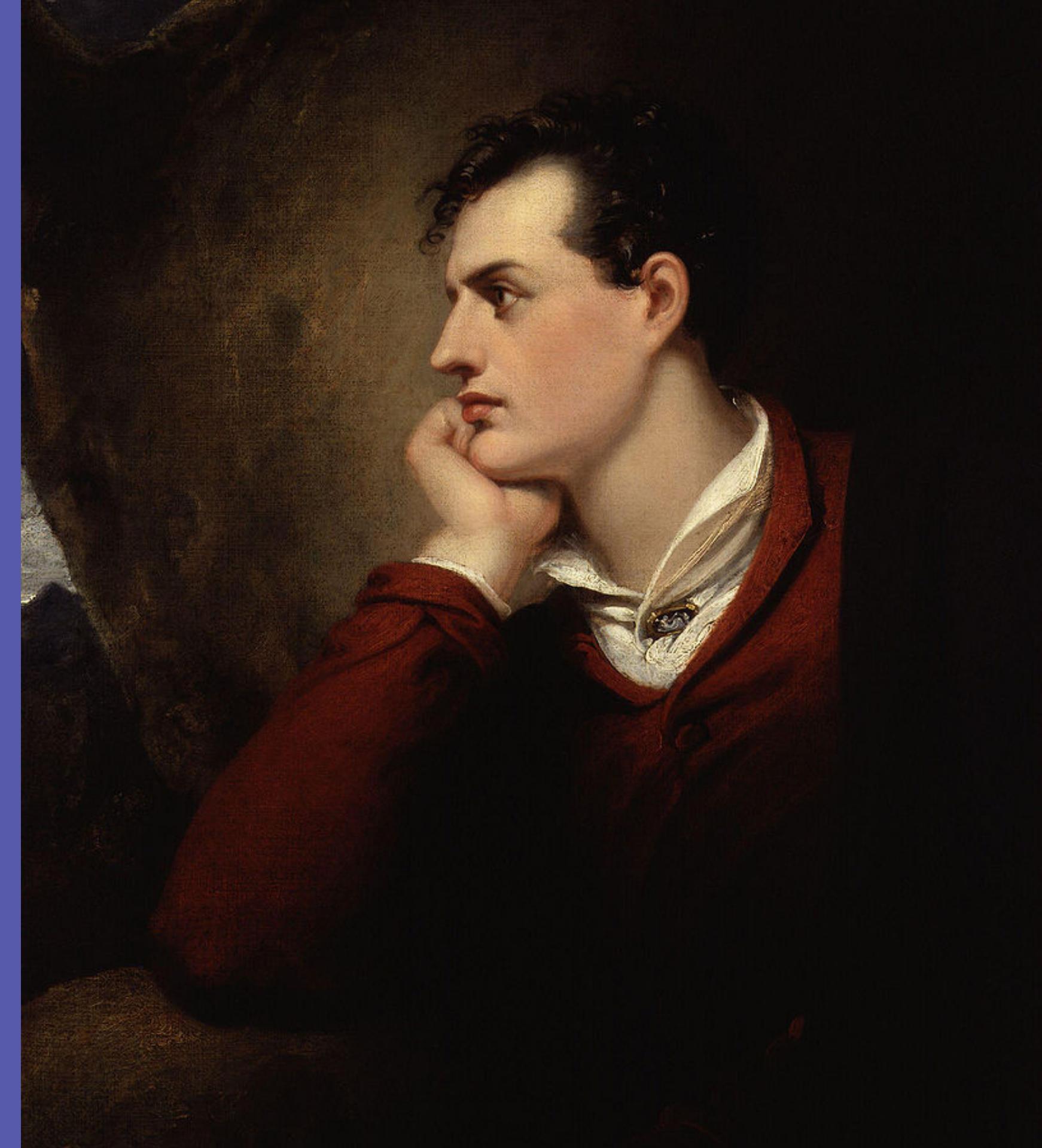


Other interesting facts about  
Ada Lovelace.



**Her mother was Anne Isabella Milbanke, Lady Wentworth - a Mathematician**

**Her father was Lord Byron -  
English poet.**



RATIONALE  
FOR THE DESIGN OF THE  
**ADA**  
PROGRAMMING LANGUAGE

JEAN D. ICHBIAH  
JOHN G.P. BARNES  
ROBERT J. FIRTH  
MIKE WOODGER

The Department of Defense  
created a programming  
language named after her.

**Ada Lovelace Day** is celebrated in mid October.

Its goal is to "... raise the profile of women in science, technology, engineering and maths," and to "create new role models for girls and women" in these fields.



My daughter's middle name is  
Ada.

