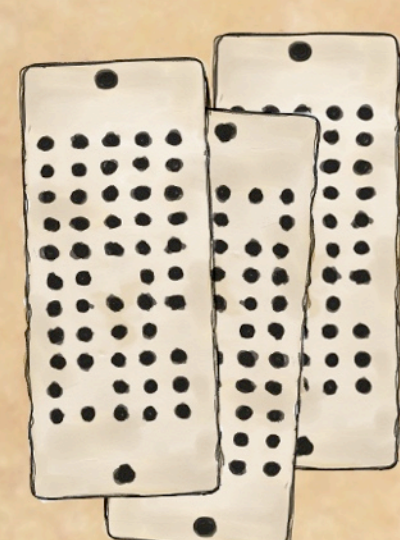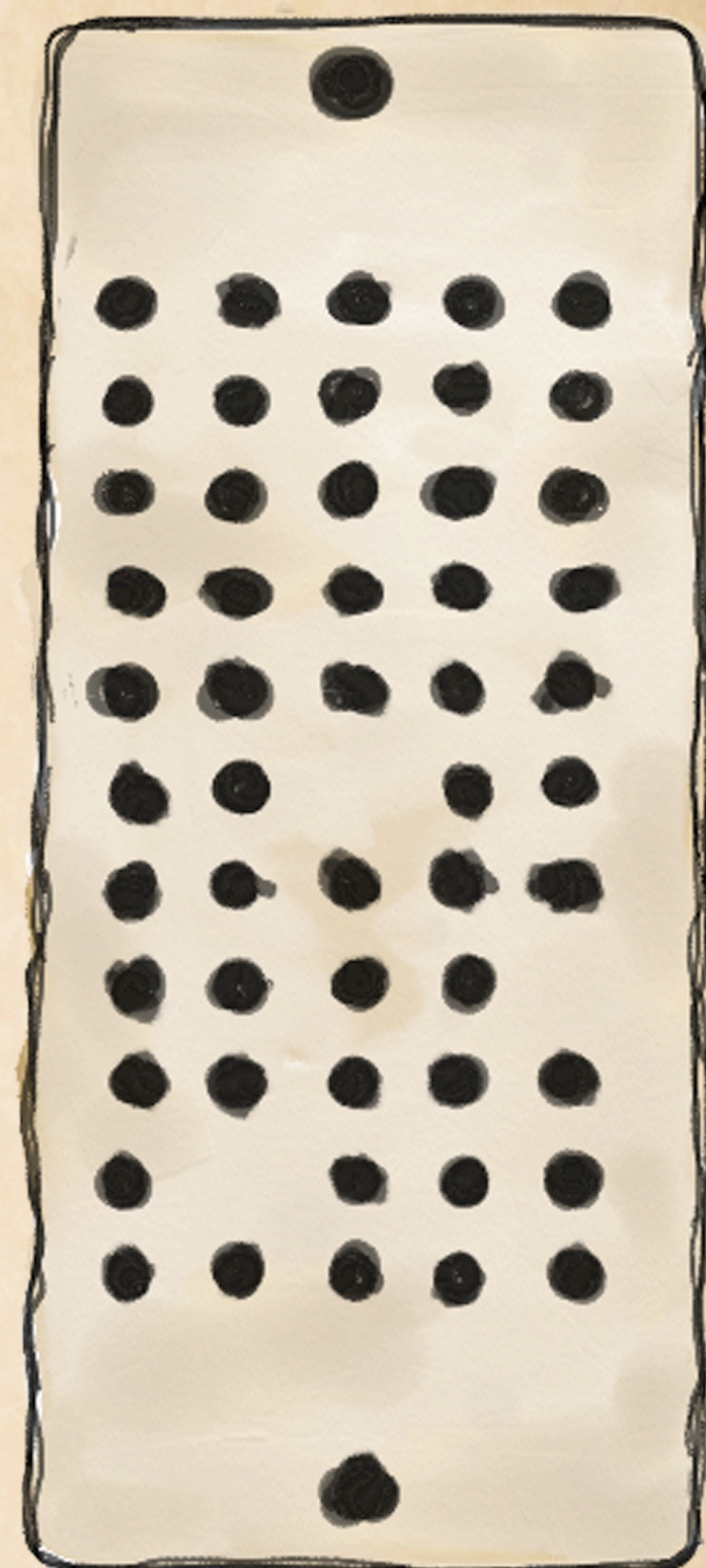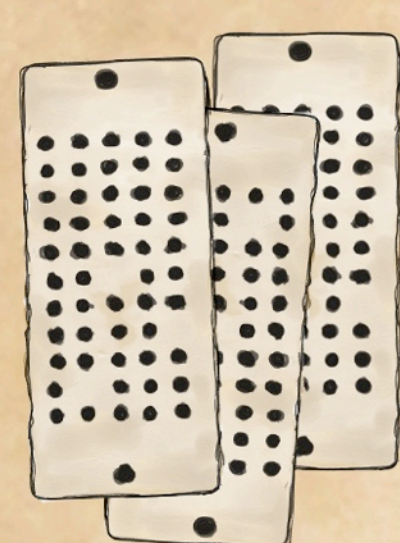# ADA LOVELACE

FIRST COMPUTER PROGRAMMER

The Analytical Engine

Lovelace's program turned a complex formula into simple calculations that could be encoded on punched cards and fed into Charles Babbage's Analytical Engine, a mechanical computer that he designed but never built. She published it in 1843, a century before the modern computer age.

"I want to put in something about Bernoulli's Number, in one of my Notes, as an example of how an explicit function may be worked out by the engine, without having been worked out by human head and hands first."

$$\frac{x}{e^x - 1} = \frac{1}{1 + \frac{x}{2} + \frac{x^2}{2\cdot3} + \frac{x^3}{2\cdot3\cdot4} + \&c.}$$

A Universal Computer

Lovelace did more than write the first computer program. She was also the first person to realise that a general purpose computer could do anything, given the right data and instructions.

"The Analytical Engine weaves algebraic patterns just as the Jacquard loom weaves flowers and leaves."

"Supposing, for instance, that the fundamental relations of pitched sounds in the science of harmony and of musical composition were susceptible of such expression and adaptations, the engine might compose elaborate and scientific pieces of music of any degree of complexity or extent."

**Augusta Ada King,
Countess of Lovelace**
**Born: 10 December 1815
Died: 27 November 1852**