

Istorija i filozofija računarstva

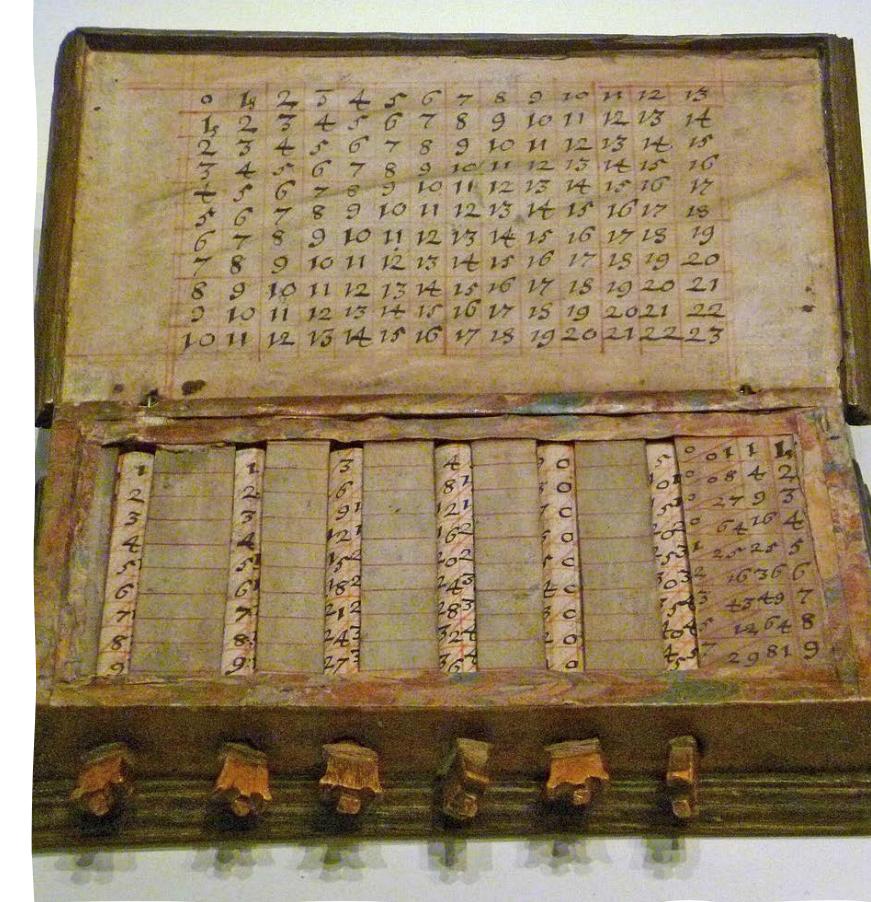
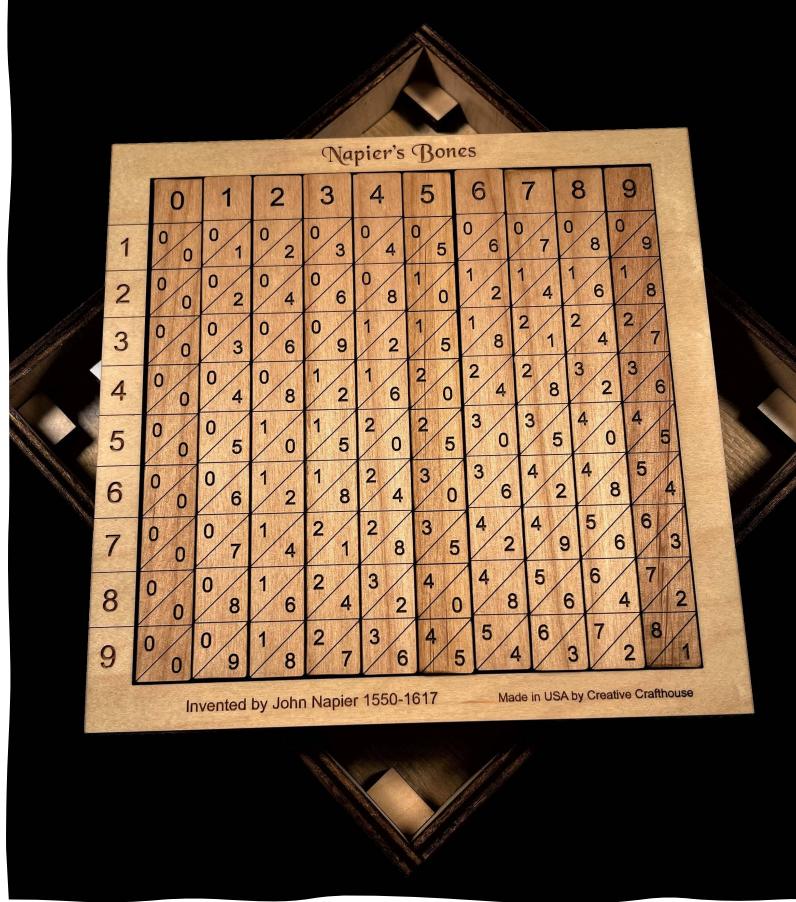
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Staša Vujičić Stanković

Mehanička era



- Period od 1450. do 1840. godine
- Johan Guntenberg – oko 1450. god. – štamparska presa

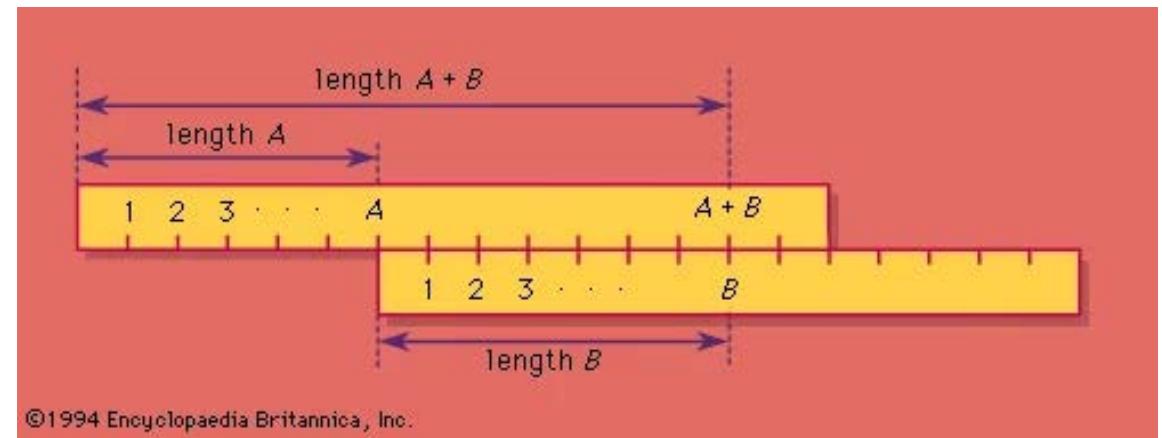
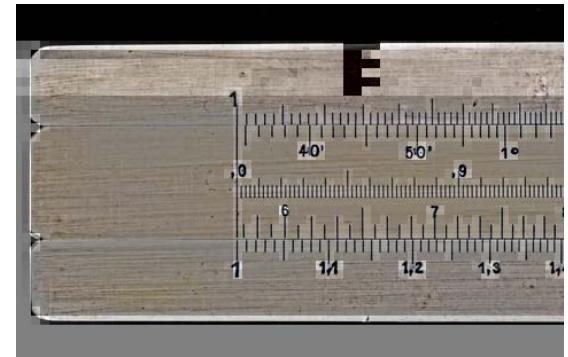


Mehanička era

- Džon Neper, 1614. godine – konstruisao različita sredstva za računanje od kojih su najpoznatija Neperove kosti i kalkulator u obliku šahovske table.

Mehanička era

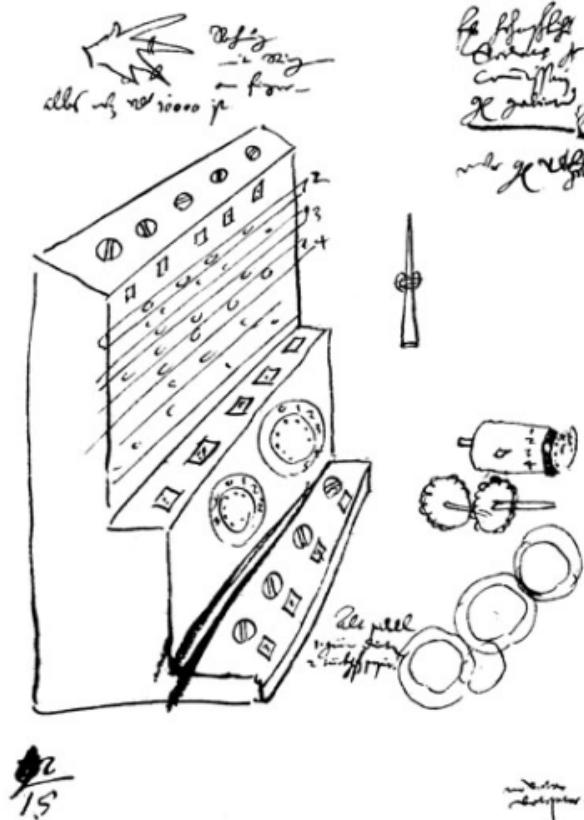
- Vilijam Otred – oko 1600-tih – „klizajući lenjir” (šiber)



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Mehanička era

- Viljem Šikard – 1623. godina – prva mašina koja je mogla da izvodi računske operacije.



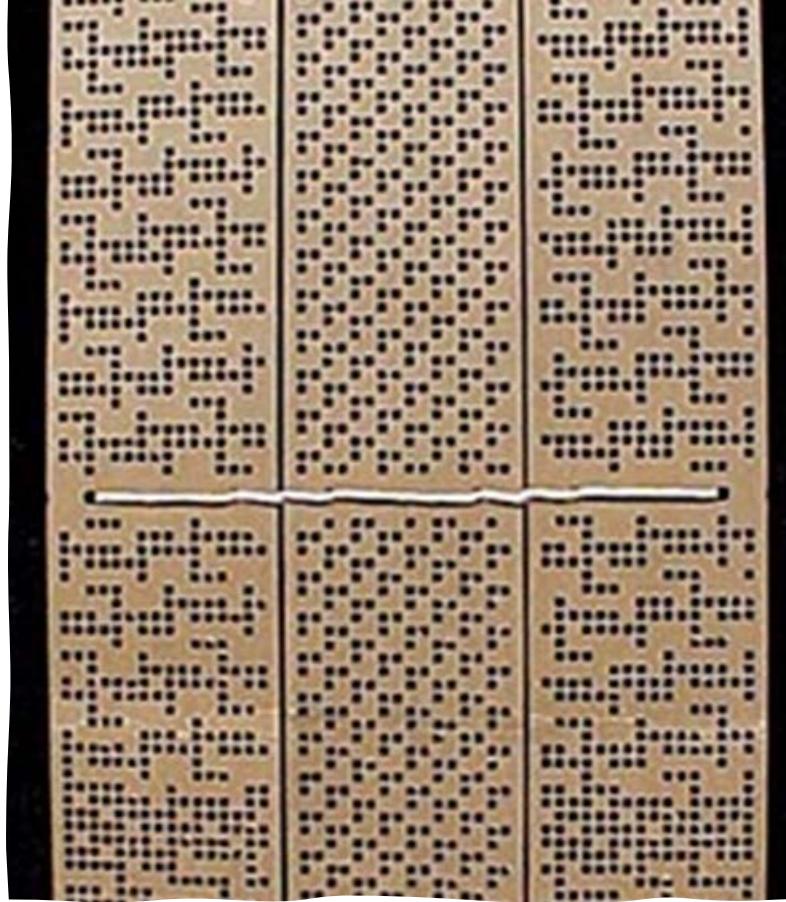


Mehanička era

- Blez Paskal – 1642. godina – Paskalina – sabiranje i oduzimanje osmocifrenih brojeva
- Gotfrid Vilhelm Lajbnic – 1672. god. – unapredio Paskalinu komponentama za množenje i deljenje.

Mehanička era – Lajbnic i matematička logika

- 1697 – predstavlja binarni brojni sistem
- Postavlja osnove za univerzalni jezik matematike u formalnoj i simboličkoj logici. Izneo je glavne karakteristike konjunkcije, disjunkcije, negacije, identiteta, podskupova i praznih skupova.
- Postavio je teoretske osnove za oblasti kao što su:
 - digitalna logika (dizajn prekidačkih kola)
 - relacione baze podataka
 - teorija formalnih jezika, automata i izračunljivosti
 - veštačka inteligencija ...



Mehanička era

- Žozef Mari Žakar – 1801. god. – Žakarov razboj

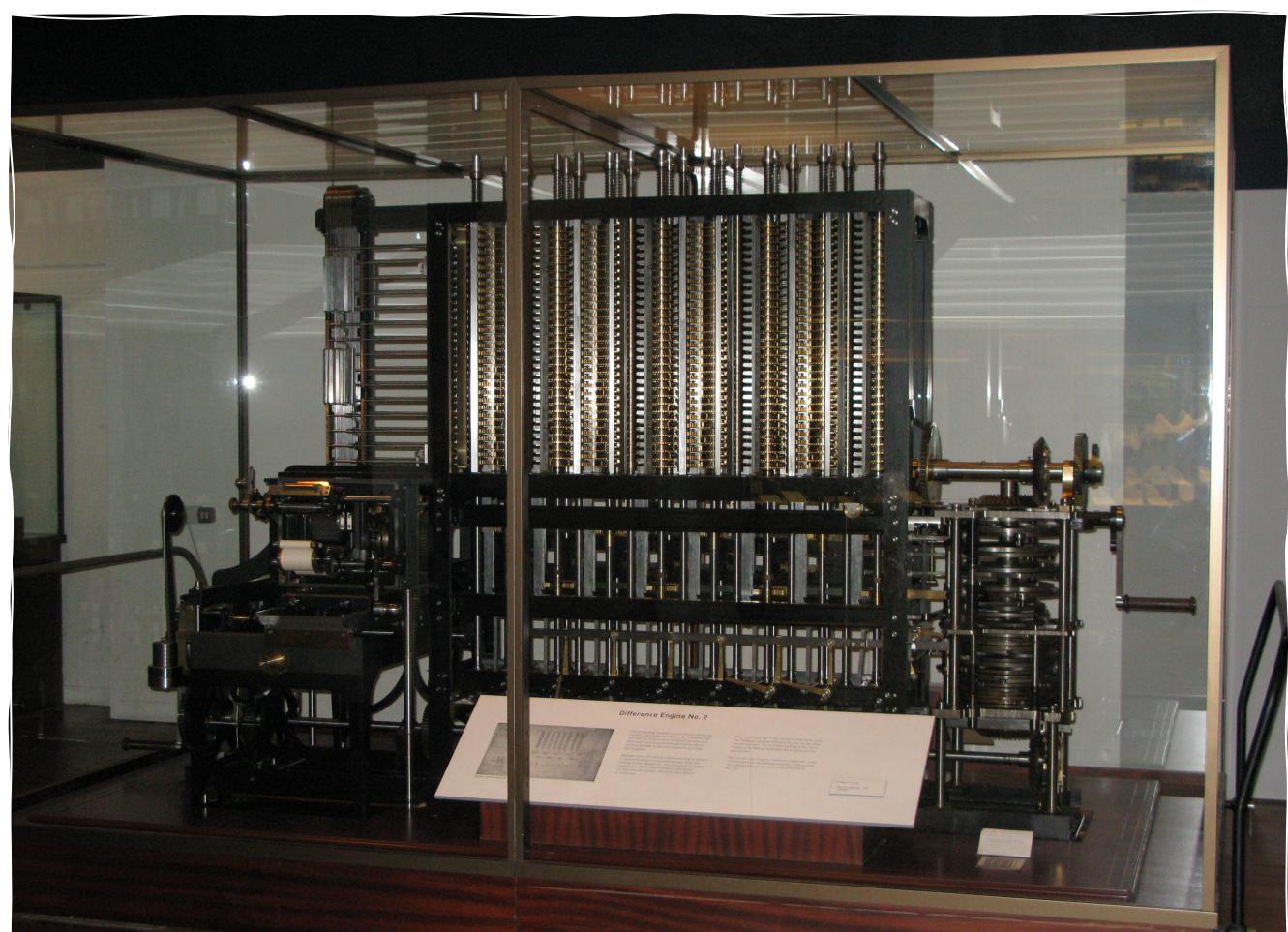
Mehanička era

- Čarls Ksavier Tomas de Kolmar
– 1820. god. –
aritmometar



Mehanička era

- Čarls Bebidž
(1791-1871) – „otac“ računarstva
- 1822. god. –
Diferencijska mašina
(1832. god. – prototip)
- 1833. god. –
analitička mašina
„programabilni računar“





Augusta Ada Bajron
(1815-1852) –
prvi računarski programer
na svetu



Diagram for the computation by the Engine of the Numbers of Bernoulli. See Note G. (page 722 et seq.)

| Variables acted upon. | Variables receiving results. | Indication of change in the value on any Variable. | Statement of Results. | | | Data. | | Working Variables. | | | | | | | | | | Result Variables. | | |
|-----------------------------|------------------------------------|---|---|--------|--------|--------|--------|--------------------|--------|--------|--------|-----------|-----------|-----------|-----------|-----------|----------------|------------------------------------|--|---|
| | | | IV_1 | IV_2 | IV_3 | $0V_4$ | $0V_5$ | $0V_6$ | $0V_7$ | $0V_8$ | $0V_9$ | $0V_{10}$ | $0V_{11}$ | $0V_{12}$ | $0V_{13}$ | IV_{24} | IV_{25} | IV_{26} | $0V_{21}$ | |
| | | | 1 | 2 | n | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | B ₁ | B ₂ | B ₃ | 0 |
| $IV_2 \times IV_3$ | IV_4, IV_5, IV_6 | $\begin{cases} IV_2 = IV_2 \\ IV_3 = IV_3 \end{cases} = 2n \dots$ | | 2 | n | 2n | 2n | 2n | | | | | | | | | | | | |
| $IV_4 - IV_1$ | $2V_4$ | $\begin{cases} IV_4 = 2V_4 \\ IV_1 = IV_1 \end{cases} = 2n-1 \dots$ | | 1 | | | 2n-1 | | | | | | | | | | | | | |
| $IV_5 + IV_1$ | $2V_5$ | $\begin{cases} IV_5 = 2V_5 \\ IV_1 = IV_1 \end{cases} = 2n+1 \dots$ | | 1 | | | | 2n+1 | | | | | | | | | | | | |
| $2V_5 + 2V_4$ | IV_{11} | $\begin{cases} 2V_5 = 0V_5 \\ 2V_4 = 0V_4 \end{cases} = 2n-1 \dots$ | | | | 0 | 0 | | | | | | | | | | | | | |
| $IV_{11} + IV_2$ | $2V_{11}$ | $\begin{cases} IV_{11} = 2V_{11} \\ IV_2 = IV_2 \end{cases} = \frac{1}{2} \cdot \frac{2n-1}{2n+1} \dots$ | | 2 | | | | | | | | | | | | | | | | |
| $0V_{13} - 2V_{11}$ | IV_{13} | $\begin{cases} 0V_{13} = 0V_{11} \\ 0V_{11} = IV_{11} \end{cases} = -\frac{1}{2} \cdot \frac{2n-1}{2n+1} = A_0 \dots$ | | | | | | | | | | | | | | | | 0 | | |
| $IV_3 - IV_1$ | IV_{10} | $\begin{cases} IV_3 = IV_3 \\ IV_1 = IV_1 \end{cases} = n-1 (= 3) \dots$ | | 1 | | n | | | | | | | | | | | | | $-\frac{1}{2} \cdot \frac{2n-1}{2n+1} = A_0$ | |
| 8 | + $IV_2 + 0V_7$ | IV_7 | $\begin{cases} IV_2 = IV_2 \\ 0V_7 = IV_7 \end{cases} = 2+0=2 \dots$ | | 2 | | | | | | | | 2 | | | | | | | |
| 9 | + $IV_6 + IV_7$ | $3V_{11}$ | $\begin{cases} IV_6 = IV_6 \\ 0V_{11} = 3V_{11} \end{cases} = \frac{2n}{2} = A_1 \dots$ | | | | | | | | | | 2n | 2 | | | | | $\frac{2n}{2} = A_1$ | |
| 10 | $\times IV_{21} \times 3V_{11}$ | IV_{12} | $\begin{cases} IV_{21} = IV_{21} \\ 3V_{11} = 3V_{11} \end{cases} = B_1 \cdot \frac{2n}{2} = B_1 A_1 \dots$ | | | | | | | | | | | | | | | $B_1 \cdot \frac{2n}{2} = B_1 A_1$ | | |
| 11 | + $IV_{12} + IV_{13}$ | $2V_{13}$ | $\begin{cases} IV_{12} = 0V_{12} \\ IV_{13} = 2V_{13} \end{cases} = -\frac{1}{2} \cdot \frac{2n-1}{2n+1} + B_1 \cdot \frac{2n}{2} \dots$ | | | | | | | | | | | | | | | 0 | $\left\{ -\frac{1}{2} \cdot \frac{2n-1}{2n+1} + B_1 \cdot \frac{2n}{2} \right\}$ | |
| 12 | - $IV_{10} - IV_1$ | $2V_{10}$ | $\begin{cases} IV_{10} = 2V_{10} \\ IV_1 = IV_1 \end{cases} = n-2 (= 2) \dots$ | | 1 | | | | | | | | | | | | | | | |
| 13 | - $IV_6 - IV_1$ | $2V_6$ | $\begin{cases} IV_6 = 2V_6 \\ IV_1 = IV_1 \end{cases} = 2n-1 \dots$ | | 1 | | | | | | | | 2n-1 | | | | | | | |
| 14 | + $IV_1 + IV_7$ | $2V_7$ | $\begin{cases} IV_1 = IV_1 \\ IV_7 = 2V_7 \end{cases} = 2+1=3 \dots$ | | 1 | | | | | | | | 3 | | | | | | | |
| 15 | + $2V_6 + 2V_7$ | IV_8 | $\begin{cases} 2V_6 = 2V_6 \\ 2V_7 = 2V_7 \end{cases} = \frac{2n-1}{3} \dots$ | | | | | | | | | | 2n-1 | | | | | | | |
| 16 | $\times IV_8 \times 3V_{11}$ | IV_{11} | $\begin{cases} IV_8 = 0V_8 \\ 3V_{11} = 3V_{11} \end{cases} = \frac{2n}{3} \cdot \frac{2n-1}{3} \dots$ | | | | | | | | | | 0 | | | | | | $\frac{2n}{3} \cdot \frac{2n-1}{3}$ | |
| 17 | - $2V_6 - IV_1$ | $3V_6$ | $\begin{cases} 2V_6 = 3V_6 \\ IV_1 = IV_1 \end{cases} = 2n-2 \dots$ | | 1 | | | | | | | | 2n-2 | | | | | | | |
| 18 | + $IV_1 + 2V_7$ | $2V_7$ | $\begin{cases} IV_1 = IV_1 \\ 2V_7 = 3V_7 \end{cases} = 3+1=4 \dots$ | | 1 | | | | | | | | 4 | | | | | | | |
| 19 | + $2V_7 + 3V_7$ | IV_9 | $\begin{cases} 2V_7 = 3V_7 \\ 3V_7 = 3V_7 \end{cases} = \frac{2n-2}{4} \dots$ | | | | | | | | | | 2n-2 | | | | | | | |
| 20 | $\times IV_1 \times 4V_{11}$ | $5V_{11}$ | $\begin{cases} IV_1 = IV_1 \\ 4V_{11} = 5V_{11} \end{cases} = \frac{2n}{3} \cdot \frac{2n-1}{4} = A_3 \dots$ | | | | | | | | | | 0 | | | | | | | |
| 21 | $\times IV_1 \times 5V_1$ | $0V_{12}$ | $\begin{cases} IV_1 = IV_1 \\ 0V_{12} = 2V_{12} \end{cases} = B_3 \cdot \frac{2n}{2} \cdot \frac{2n-1}{3} \cdot \frac{2n-2}{3} = B_3 A_3 \dots$ | | | | | | | | | | | | | 0 | | | | |
| 22 | + $2V_1 + 2V_{13}$ | $3V_{13}$ | $\begin{cases} 2V_1 = 2V_{13} \\ 2V_{13} = 3V_{13} \end{cases} = A_0 + B_1 A_1 + B_3 A_3 \dots$ | | | | | | | | | | | | | | 0 | | $\{A_0 + B_1 A_1 + B_3 A_3\}$ | |
| 23 | - $0V_1 - IV_1$ | $3V_{10}$ | $\begin{cases} 0V_1 = 3V_{10} \\ IV_1 = IV_1 \end{cases} = n-3 (= 1) \dots$ | | 1 | | | | | | | | | | | | | | | |
| | | | Here follows a repetition of Operations thirteen to twenty-three. | | | | | | | | | | | | | | | | | |
| 24 | + $0V_{24} + 9V_{24}$ | IV_{24} | $\begin{cases} 4V_{13} = 0V_{13} \\ 0V_{24} = IV_{24} \end{cases} = B_7 \dots$ | | | | | | | | | | | | | | | | | |
| 25 | + $IV_1 + IV_3$ | IV_3 | $\begin{cases} IV_1 = IV_1 \\ IV_3 = IV_3 \end{cases} = n+1=4+1=5 \dots$ | | 1 | | n+1 | | | | | | 0 | 0 | | | | | | |
| | | | by a Variable-card. | | | | | | | | | | | | | | | | | |
| | | | by a Variable card. | | | | | | | | | | | | | | | | | |

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- Computer History Museum
- Timeline of Computer History
- Early analog computational devices
- Early digital computational devices
- ...

Hvala



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