

June 15, 1948

COWLES COMMISSION DISCUSSION PAPER: STATISTICS 314

Comparison of Computing Machines

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This outline is a summary of information and hearsay being accumulated concerning computing machines. The information presented should be taken to be a fair guess as to the true state of affairs. It should be pointed out that so far the only ten machines which have a right to be called automatic sequence controlled would be the EDVAC, von Neumann, Univac and Mark III. The Eniac was left out of discussion in spite of its great speed because it does not contain the important features of automaticity. The importance of this feature was made evident through the existence of the Eniac.

The Reeves Instrument Company is building an electronic calculator for the University of Illinois, but I have no information concerning this machine.

desk machine	General IBM Machinery	Relay Cal. IBM	Alken Mark IC Mark IIA Bell Tel. B	Edvac	von Neumann
			Marks indicate relative merits		

Speed: at top efficiency.....
 overall.....
 (per minute)

4	50-100	50/600	30-70	10,000	25,000
1-1 1/2	3-5	50	10-30	1000-5000	probably 5000-15000

Input-output

Important for they are limiting factors	100 cards. well balanced except for sorting and electronic multiplier machine	100. needs other IBM machines	paper tapes and punch cards. slow	no faster than 1800. wire tapes	wire tapes
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coding

simple depending on computers	2 hours for simple prob. to 2 days or so for complex coding-mixing. A plugboard and can be stored	less than a week for one person	complicated 2 weeks or more for rel. complex problem	should be less complicated than B.T.	same as EDVAC
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memory:

immediate.....	They can barely remember previous card	30-6 pl. no.'s permit mach. to handle	70-200. 10 to 20 place no.'s	internal memory of about 1000 ten digit dec. no.'s mercury delay line: it limits speed	faster internal memory 100 40 digit binary numbers
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$$\sqrt{\frac{a_1 x_1 + a_2 x_2}{x_3}}$$

intermediate.....

paper. This is on-ly memory which might be called square

A sequence of cards can be used

Tapes, cards slow trans-fer. tapes need chang-
ing

wire tape. 150,000 10 figure no.'s slow: 1800 per min.

wire tape the speed of trans-fer is im-
portant

reliability

Poor: C careful check vital

B Fair Because of careful checks

C+ More sensi-
tive than usual IBM

I II B.T. C+ B- B- need continued maintenance

B+ should be good because of compact-
ness. Quest. How much is lost if some tube blows out.

A- because of compactness

significant figures

10

8x8-16 for mult. up to 80 for add.

add 12 mult. 6x6-12

10-20

10

40 binaries

decimal consi-
derations

This prob. its of small import. be-
cause of slow input output

like IBM

Floating Decimal

all numbers less than one

all numbers less than one

Completeness

complete

complete

can be sim-
plified

transition

nearing com-
pletion. s/b debugged in october

nearing com-
pletion

crew when ef-
ficient, not including mathe-
maticians or main-
tenance men

1 per mach. oper. to be repeated 50-200 times

2-4 persons repeated 1000-10000 times

3-4 like IBM only for more com-
plex prob.

5 complicated problems can be handled efficiently if there are many repeti-
tions

about 1 almost any-
thing which takes more than a day by hand

1 Same as EDVAC only more so

Univac. Extension of EDVAC.
Probably faster. A little more compact, and simpler coding. Several tapes. Handles alphabetic information. Probably good for problems involving sifting a great deal of statistical data.

IBM
Elec-
tronic More complicated than it should be. Coding problem bad. About speed of EDVAC. Uses Punch Cards. Already completed.

Aiken
Mark
III A slow but true automatic. Will have 4000, 12 digit decimal no.'s in internal memory. Aiken is striving for reliability but size will probably affect it. To be ready in about 1 1/2 years. Will probably use a floating decimal. Large memory will be of great importance.