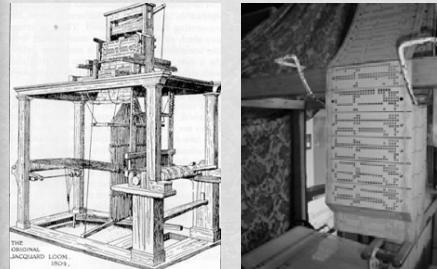


The Evolution of Information Technology: Origins

Ian King, Sr. Vintage Systems Engineer
Living Computer Museum
Vulcan, Inc.

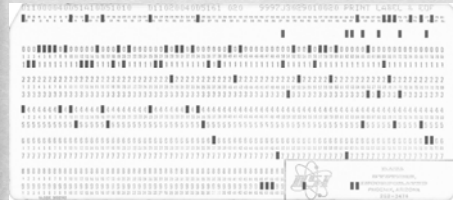
Before the beginning: process automation



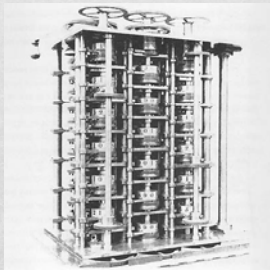
Before the beginning: tabulation



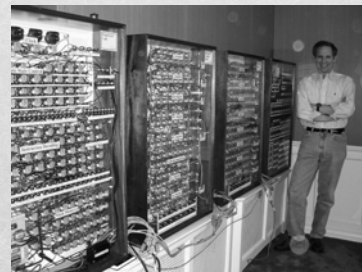
Before the beginning: tabulation



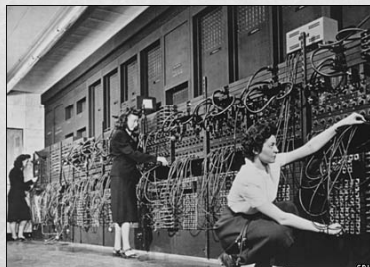
Before the beginning: automated calculation



Electronic digital computer



Programming the ENIAC



Program? Data? The von Neumann approach

0010 0101 0001

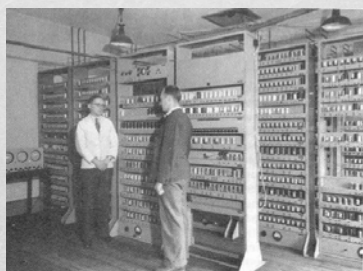
593₁₀

'IQ'

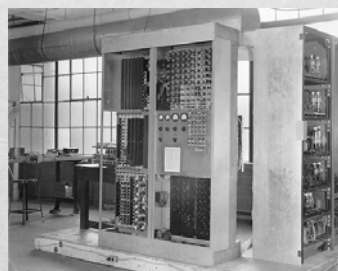
TAD 0001

➤ two's complement add, AC ← (location 0001) + AC

Stored Program Electronic Digital Computer



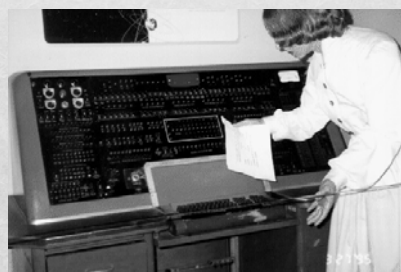
Stored Program Electronic Digital Computer



UNIVAC I



UNIVAC I



UNIVAC I



And what of IBM?



IBM's greatest hits



IBM System/360



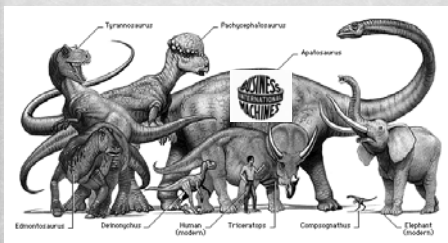
IBM System/360



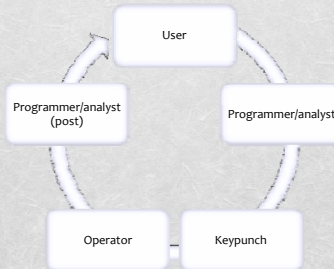
IBM System/360



When dinosaurs ruled the earth



When dinosaurs ruled the Earth



Programming paradigms

Job No. _____ Program No. _____ prepared by _____ Date written _____

Problem: _____

Program Segment Number	Location	Description	Comments or Address	Notes
0.0	000000	START		
0.1	000001	INITIALIZE		
0.2	000002	READ DATA		
0.3	000003	PROCESS DATA		
0.4	000004	WRITE RESULTS		
0.5	000005	STOP		

Programming paradigms

```

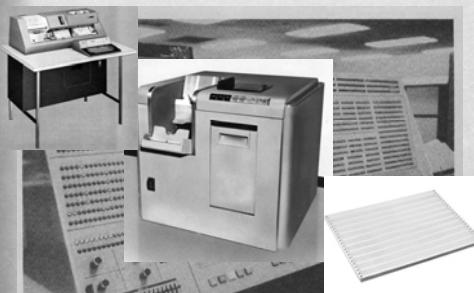
00000 0000 00 0 00000  START 001 001
00001 0000 00 0 00000  LOOP 002 002
00002 0000 00 0 00000  CLA 003 003
00003 0000 00 0 00000  SUB 004 004
00004 0000 00 0 00000  TZE 005 005
00005 0000 00 0 00000  TLE 006 006
00006 0000 00 0 00000  TGE 007 007
00007 0000 00 0 00000  TSE 008 008
00008 0000 00 0 00000  TDE 009 009
00009 0000 00 0 00000  TSE 010 010
00010 0000 00 0 00000  TSE 011 011
00011 0000 00 0 00000  TSE 012 012
00012 0000 00 0 00000  TSE 013 013
00013 0000 00 0 00000  TSE 014 014
00014 0000 00 0 00000  TSE 015 015
00015 0000 00 0 00000  TSE 016 016
00016 0000 00 0 00000  TSE 017 017
00017 0000 00 0 00000  TSE 018 018
00018 0000 00 0 00000  TSE 019 019
00019 0000 00 0 00000  TSE 020 020
00020 0000 00 0 00000  TSE 021 021
00021 0000 00 0 00000  TSE 022 022
00022 0000 00 0 00000  TSE 023 023
00023 0000 00 0 00000  TSE 024 024
00024 0000 00 0 00000  TSE 025 025
00025 0000 00 0 00000  TSE 026 026
00026 0000 00 0 00000  TSE 027 027
00027 0000 00 0 00000  TSE 028 028
00028 0000 00 0 00000  TSE 029 029
00029 0000 00 0 00000  TSE 030 030
00030 0000 00 0 00000  TSE 031 031
00031 0000 00 0 00000  TSE 032 032
00032 0000 00 0 00000  TSE 033 033
00033 0000 00 0 00000  TSE 034 034
00034 0000 00 0 00000  TSE 035 035
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00037 0000 00 0 00000  TSE 038 038
00038 0000 00 0 00000  TSE 039 039
00039 0000 00 0 00000  TSE 040 040
00040 0000 00 0 00000  TSE 041 041
00041 0000 00 0 00000  TSE 042 042
00042 0000 00 0 00000  TSE 043 043
00043 0000 00 0 00000  TSE 044 044
00044 0000 00 0 00000  TSE 045 045
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00095 0000 00 0 00000  TSE 096 096
00096 0000 00 0 00000  TSE 097 097
00097 0000 00 0 00000  TSE 098 098
00098 0000 00 0 00000  TSE 099 099
00099 0000 00 0 00000  TSE 100 100
    
```

Programming paradigms

The following table shows the structure of a program, including the location of each segment and the description of the segment.

Program Segment Number	Location	Description	Comments or Address	Notes
0.0	000000	START		
0.1	000001	INITIALIZE		
0.2	000002	READ DATA		
0.3	000003	PROCESS DATA		
0.4	000004	WRITE RESULTS		
0.5	000005	STOP		

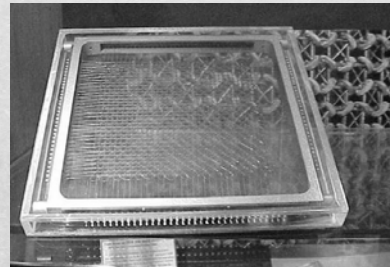
Computer/human interaction



Outliers: Whirlwind



Outliers: Whirlwind



Outliers: SAGE



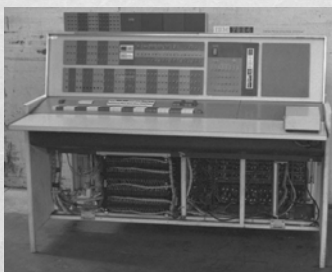
First powered: 1963
Retired: 1983

Weight: ~250 tons
Tube count: ~60,000

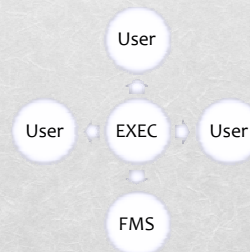
Outliers: SAGE



Outliers II



Outliers II: Compatible Time Sharing System



Under the hood: working store

- Acoustic delay lines

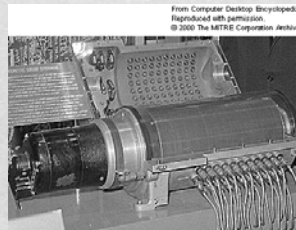


- Williams tubes



Building the machine: working store

- Magnetic drum



Building the machine: working store

- Magnetic core



Figure 6-1. A magnetic core. 128.54

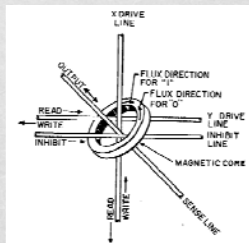
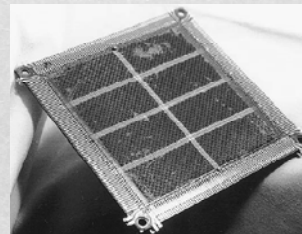


Figure 6-3. Magnetic core showing "X," "Y," inhibit, and sense lines. 128.58

Building the machine: working store

- Magnetic core



Questions?