

Programming in the 1960s: a Personal History

Len Bass

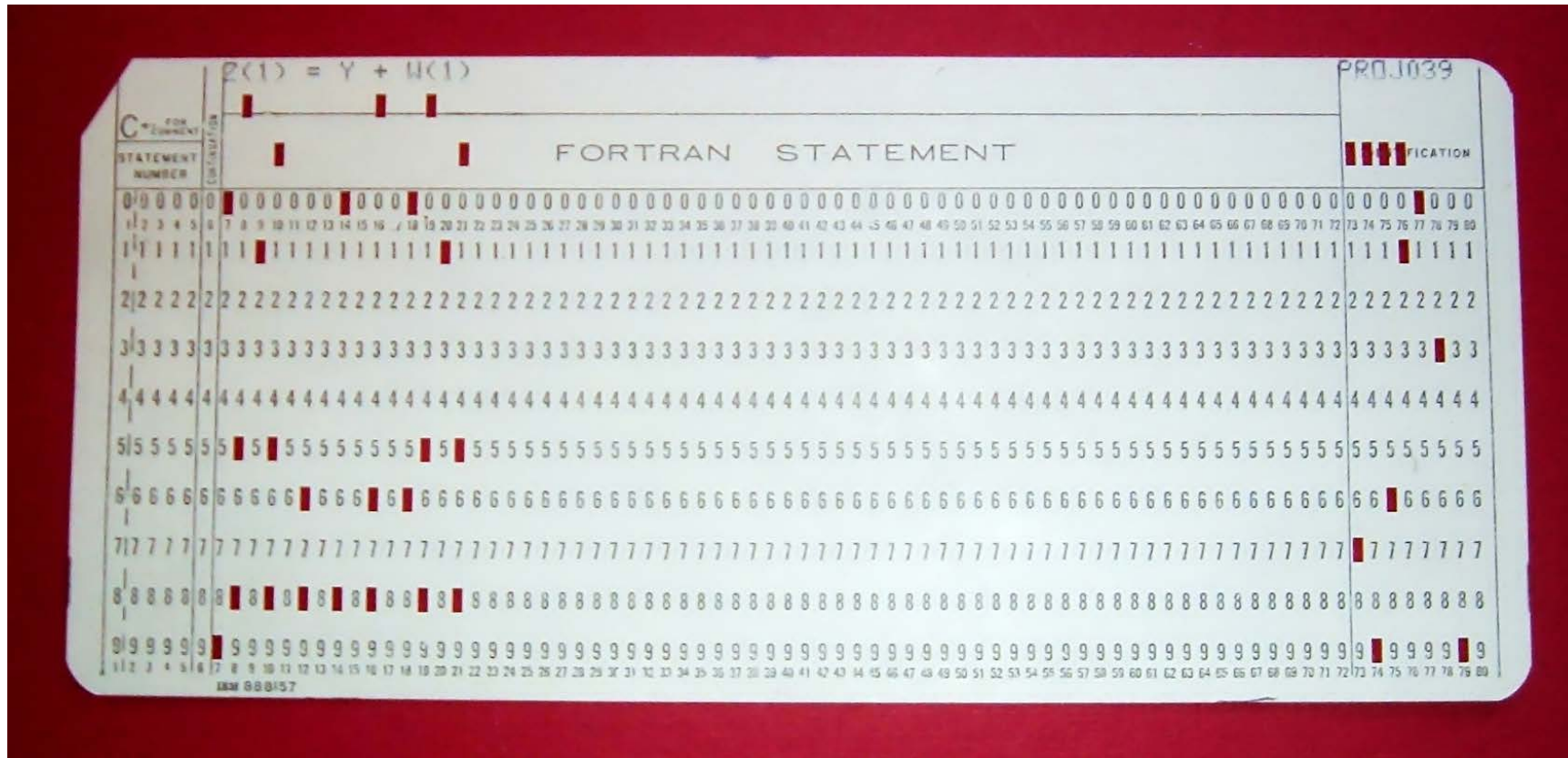
I graduated college with a Bachelor's degree in Mathematics in 1964

- Two possible positions
 - Actuary
 - Computer programmer
- Guess which one I took?
- Prior computer experience
 - Saw a computer once on a tour
 - No knowledge of programming
- I was given a thin book on Fortran II and told to learn it.
- First program was copied out of the book. It didn't work because the machine I used it on ran Fortran IV.

Job workflow - submission

- Type up submission on cards
- Place job card with submission number in front of cards
- Give cards to operator

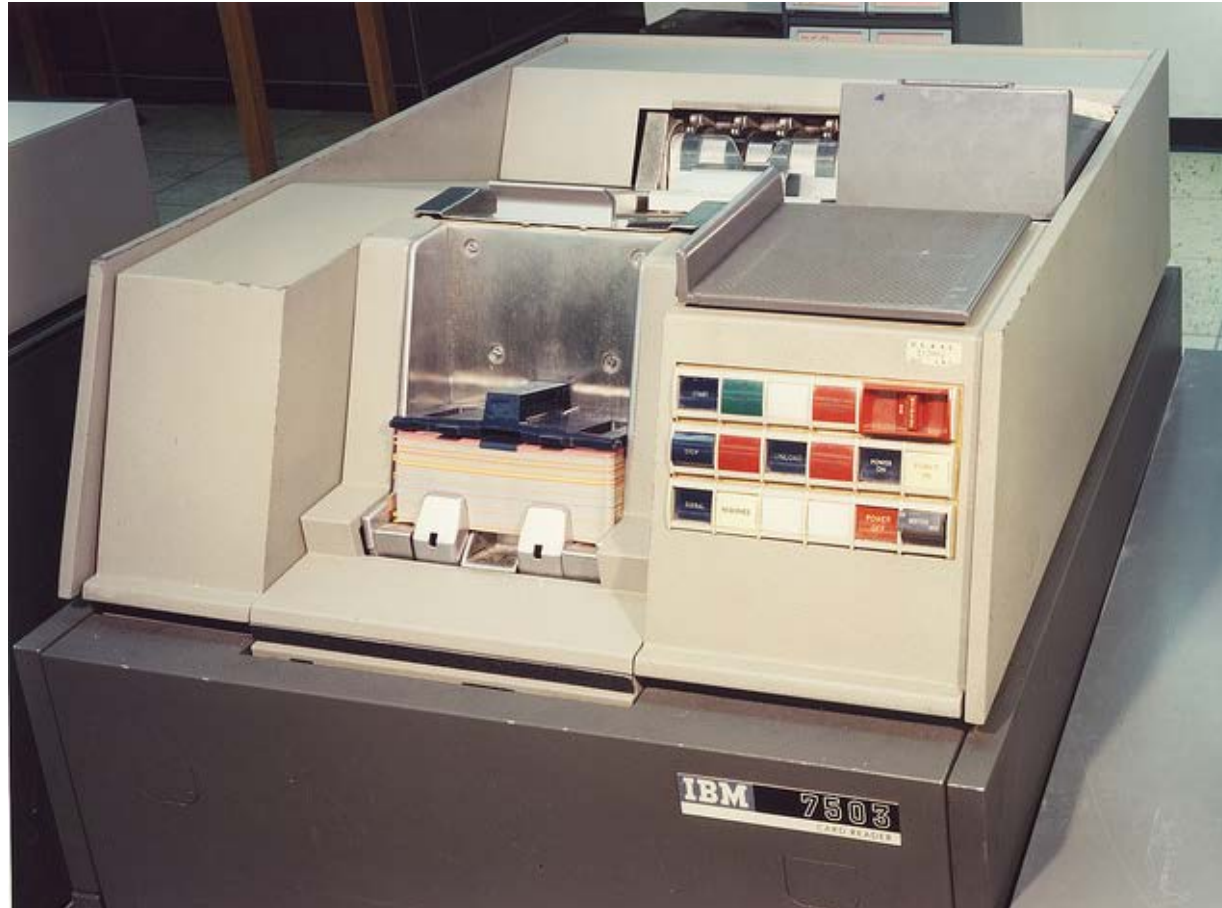
Fortran IBM card



026 Keypunch



Operator loads cards into card reader



IBM 7094 processes job



IBM Chain Printer prints output



Final portion of the workflow

- Operator takes cards and output, places them into a box with submission number in front and places box in wooden frame
- Elapsed time ~2-3 hours, typically.

First Assignment – involved Legendre Polynomials

- The formula involved computing $N! / M!$
- It took me six weeks to debug with much wasted computer time.
- Why? $7!$ overflowed when computed as an integer on a 36 bit word.
- Recall I had a degree in mathematics
 - Factorials were integers.
 - Who ever heard of “overflow”

Consequence

- Debriefing meeting with my boss and my boss' boss.
- Outcome – my boss should have overseen me more closely.
- It wasn't my fault!! It was management's fault.

1968 – I am off to graduate school at Purdue

- Purdue constructed new mathematical sciences/computer sciences building
 - Completed in 1967
 - Designed for IBM 360/67 in basement



IBM 360/67 was ~3 years late

- Purdue replaced their order with a CDC 6600



Why is this interesting?

- Mathematical Sciences building was designed to have an IBM 360/67 in the basement
- Building was constructed with an external elevator shaft to take computer to the basement
- CDC 6600 was two inches wider than the IBM 360/67
- Had to redig the elevator shaft!!

My assistantship

- Systems programmer for the High Energy Physics department
- They had an IBM 360/44. What we would today call a RISC machine

IBM 360/44



I learn to boot the machine

- I was shown how to boot the IBM 360/44
 - Push blue button on lower right
 - Enter date/time on console
- First time I did this ...

- Lights went out

- Bells went off

- There was a power failure at that moment

- It wasn't my fault!

IBM repairman as terrorist

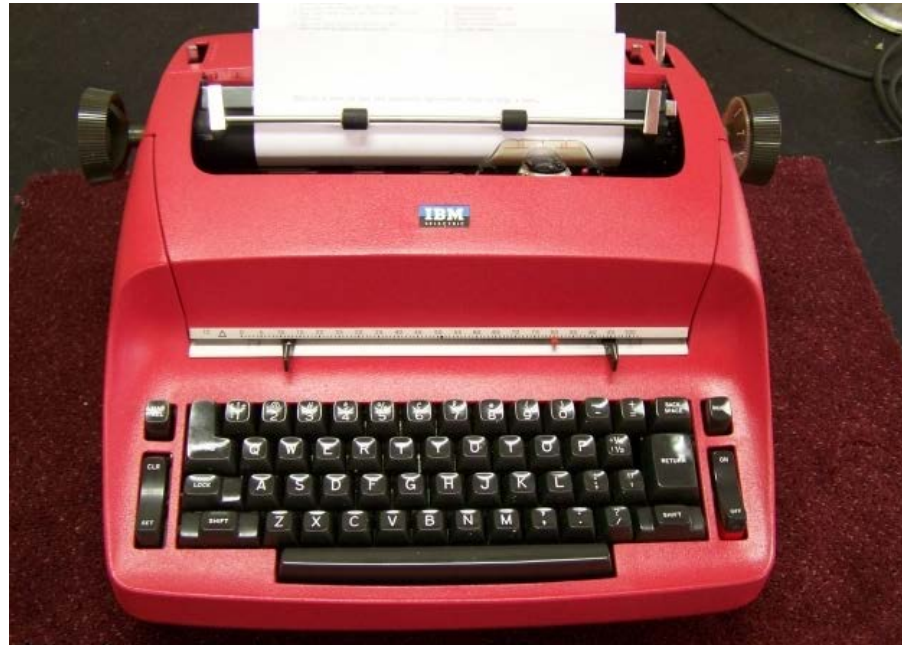
- IBM performed weekly preventive maintenance where card dust is vacuumed from inside the computer.
- Involves removing the front panel of the console
- Purdue installed intrusion alarms on all of the computers on campus including the High Energy Physics computer
- The intrusion alarm prevented the repairman from removing the front panel.
- So ... he removed the intrusion alarm

Consequences

- Removing the intrusion alarm set off a silent alarm at the campus police state
- Policemen in full riot gear and shotguns arrived at the computer.
- ...

In 1970, I get a job at the University of Rhode Island

- Computation is performed through a time-sharing machine (IBM 370/??)
- A room full of typewriter type devices is shared by students.



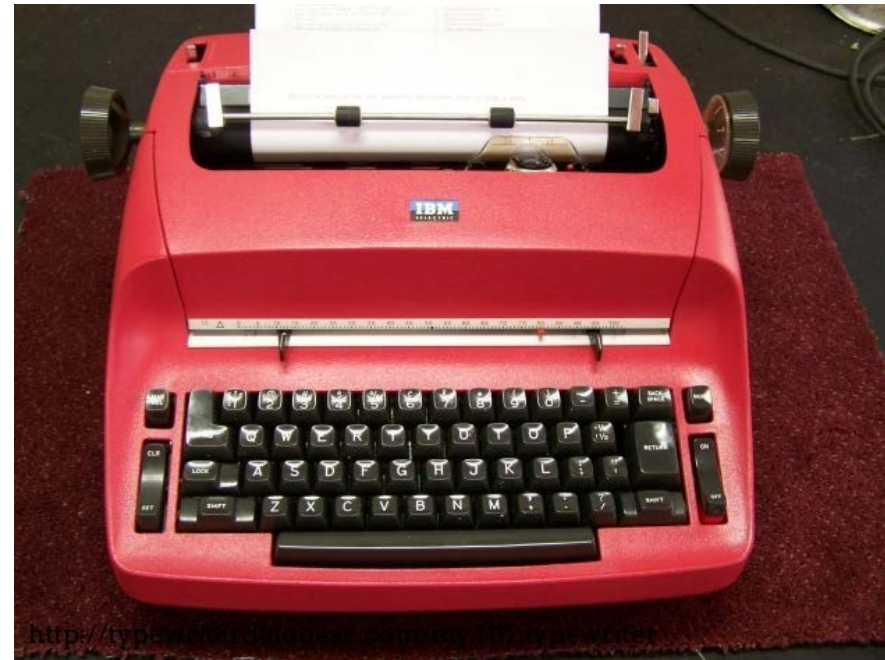
Acoustic Coupler

- User would pick up a phone and connect to a switchboard.
- Place phone into acoustic coupler and interact with computer.
- Does anyone see an anachronism in this picture?



One operational problem

- A female student with long hair got her hair caught under the paper advance.
- In her struggles to get free she would hit the “enter” key which advanced the paper.



Consequences

- At the beginning of each semester I would tell the students their first task was to find the off button.
- During the 1970s hair styles were noticeably shorter than they were during the 1960s.

Me ~1980



The world has changed!!