From ENIAC to iPad

Moments from IT history

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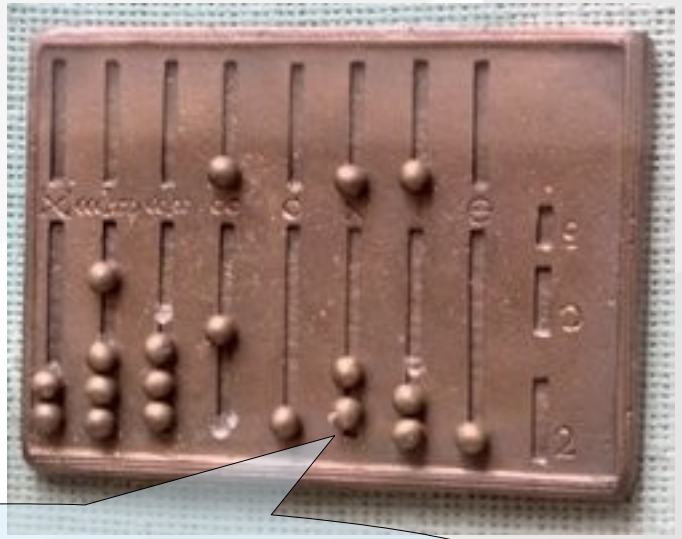
In the beginning...

- ...depends on whose account to believe :)
- Still, pretty soon afterwards, some hairy dude started to compute using sticks and stones
- The abacus existed in Ancient Egypt in about 3000 BC (some suggest even 3500 BC)



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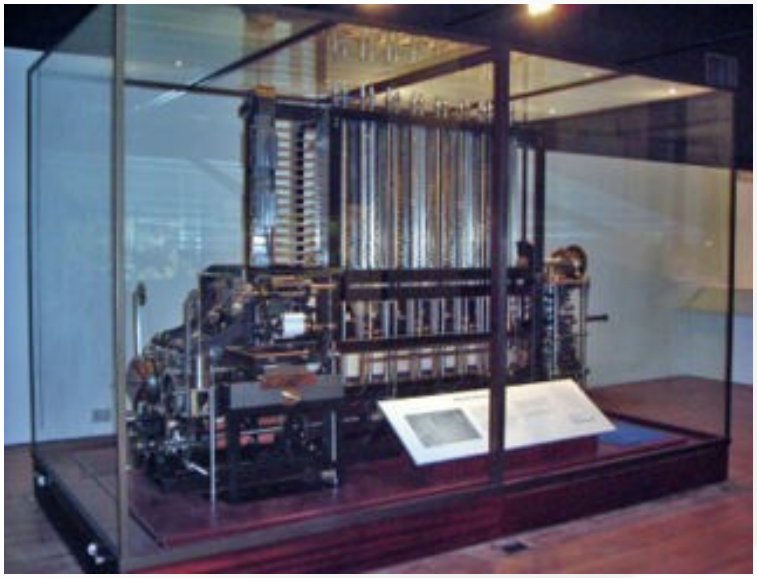
A tad later...

- Around 1500 AD – Leonardo's arithmometer (addition only; disputed)
- 1623 – Wilhelm Schickard of Tübingen builds a calculator reportedly able to add and substract six-figure numbers
- 1640 or 1645 – young Blaise Pascal aims to help his father (a clerk), building the Pascaline or 'arith-metical machine' (all four main arithmetical operations)

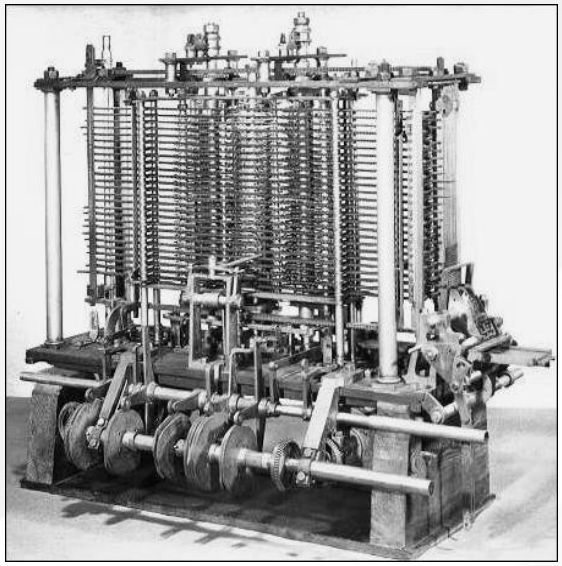
Some more time...

- 1632 – William Oughtred from Oxford builds the slide rule (the window was added in 1859 by Amedeè Mannheim)
- 1705 – G. Leibniz introduces binary numbers
- 1800/1801 – the Jacquard loom, an early programmable industrial machine
- The Babbage projects:
  - Difference Engine 1822
  - Analytical Engine 1830

The Babbage machines



Difference Engine



Analytical Engine (reproduction at British Science Museum)

(source: http://www.kerryr.net/pioneers/gallery/ns_babbage6.htm)

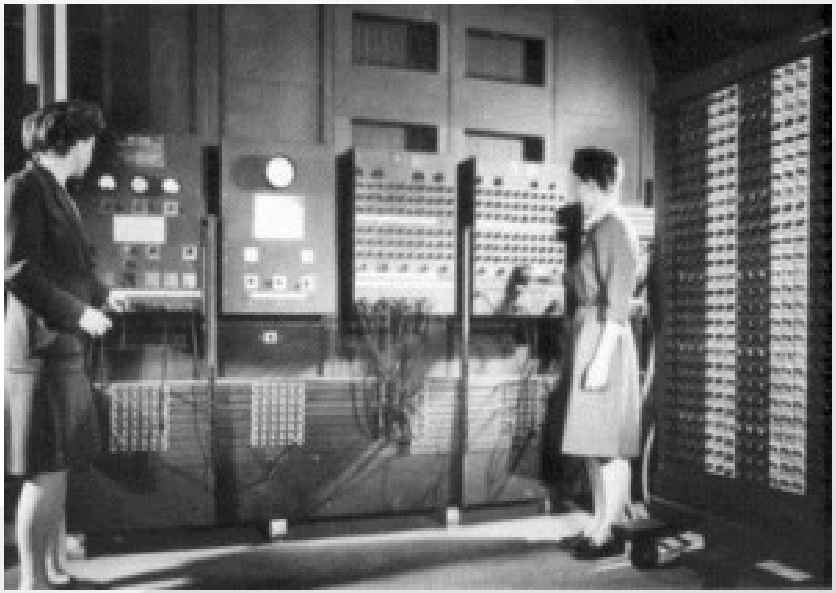
Before the modern computer

- 1857 – Sir Charles Wheatstone invents the telegraph tape
- 1874/78 - Willgodt Odhner builds an arithmometer - later known as "Felix"

- 1889 – Herman Hollerith patents the tabulating machine later used in the U.S. 1890 census
- 1926 – transistor invented at Bell
- 1936 – Dvorak keyboard

The first...?

- There are four common candidates to the title of the first electronic computer
- The most known: ENIAC (Electronic Numerical Integrator and Computer) - John Mauchly and J. Presper Eckert, Univ. of Pennsylvania 1943



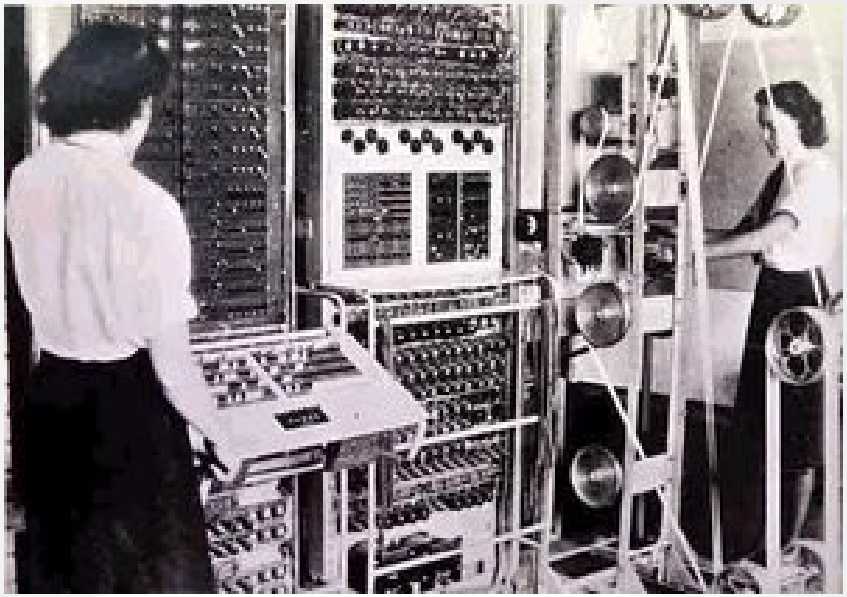
Or…?

- ABC (Atanasoff-Berry Computer)
  - John Vincent Atanasoff & Clifford Berry, Iowa State College 1943

- ABC won the 1973 court case, yet the issue is still disputed

Or rather…?

- Colossus and bombes -
  Alan Turing & Co,
  Bletchley Park, UK 1943



- Earlier than the previous two, but being the “real computer” is still contested

Or even…?

- The works by Konrad Zuse in Nazi Germany starting in 1936 (Z1, Z2, Z3). Binary!

- Zuse's Plankalkül programming language is a strong contender to the title of the first modern programming language (contained most elements of the later ALGOL)

The Stone Age

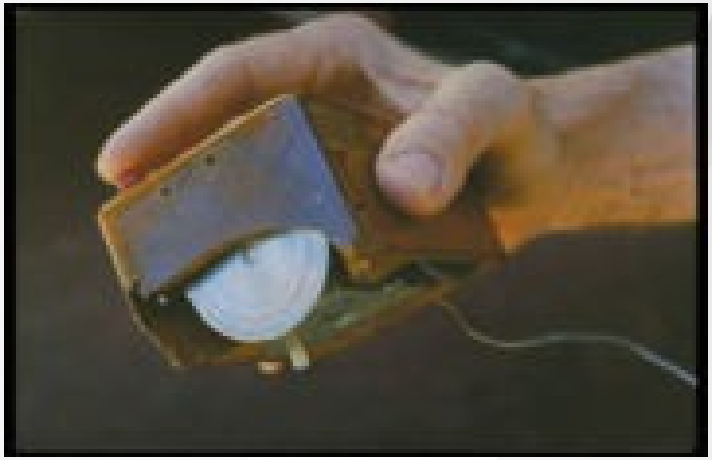
- 1945 – EDVAC, the binary computer (some consider it the first)
- 1945 (47?) - Grace Murray Hopper finds a bug
- 1948 – UNIVAC I, the first commercial computer. Bell Labs patents the transistor
- 1950 – MESM, the first Soviet computer. Alan Turing formulates the Turing test
- 1954 – transistors mass-produced
- 1956 – TX-O, the first computer built on transistors
- 1958 - Texas Instruments introduces integrated circuits

Example: IBM 650 (1954-62)

- Weight of computer: 900+ kg
- Weight of power supply: 1350 kg
- Both had boxes of 1.5 to 0.9 to 1.9 metres
- Approx. cost 500 000 USD (of the time!), monthly rent 3500 USD
- Drum memory for up to 2000 words with length up to 10

Sixties

- 1963 - Douglas Engelbart patents the computer mouse
- 1964 – Dartmouth College develops BASIC. First DEC minicomputer PDP-8
- 1966 – first disk drive (IBM)
- 1967 – first floppy disk (IBM)
- 1968 – First GUI developed by D. Engelbart in Stanford. Intel founded



Summer of ‘69

- AMD founded
- Unix born at AT&T
- Laser printer developed at HP
- Birth of Internet usually counted from here

- Plus
  - Man on the Moon
  - Linus Torvalds born in Helsinki :)

Seventies

- 1970 - Xerox PARC founded
- 1971 - 8-inch diskette by IBM. Niklaus Wirth creates Pascal
- 1972 - Intel 8008, the first 8-bit chip (200kHz). Atari founded => Pong. William H. Gates and Paul Allen start Traf-O-Data
- 1973 - Gary Kildall develops CP/M based on PL/M. Bob Metcalfe's thesis on Ethernet. IBM 3340 "Winchester" disk
- 1974 – Dennis Richie completes C language (started 1969)
- 1975 - Gates and Allen create Altair BASIC for MITS Altair and start to sell licenses – birth of Microsoft. Byte Magazine and Computer Store indicate some mainstreaming

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- 1976 - Steve Jobs and Steve Wozniak found Apple, offering the 'Kit computer'. Intel and AMD make a compatibility deal. An Wang's Text Processor. Xerox Note-Taker, the first portable (so-and-so) computer
- 1978 - Intel introduces the 4.77-MHz 8086 chip
- 1979 – VisiCalc, the first spreadsheet. First laser printer by IBM. Motorola 6800, the first 16-bit chip. 3Com and Seagate

Eighties

- 1980
  - MS XENIX OS (in fact, Microsoft's Unix)
  - Microsoft-IBM deal to provide them with (then non-existing) operating system – a suitable candidate is found at Seattle Computer Products, named QDOS (Quick-And-Dirty Operating System). Somehow, it ends up with Microsoft
  - Sony introduces the 3.5-inch floppy and Seagate the 5.25-inch hard disk
  - CD audio standard (Philips, Sony)

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- 1981 - MS fully obtains QDOS, renaming it to MS-DOS. IBM 5150 becomes “The PC”. Novell creates the first networked filesharing system (later evolving to NetWare). Silicon Graphics founded. Osborne 1, the first laptop (sort of)
- 1982 - IBM switches PCs from CP/M to MS-DOS 1.1. “The Clone Wars”. The PC Mouse from Mouse Systems. Intel 286 (6MHz). Sun and Adobe founded. SunOS 1.0 (later becoming Solaris)

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- 1983 -IBM PC XT, Apple IIe and Lisa (Macintosh?). First "windoze"... Borland, Compaq and Electronic Arts. An Wang introduces SIMM memory module. Bjarne Stroustrup develops C++. Multi-Tool Word, WP 3.0 and Lotus 1-2-3. Richard Stallman starts GNU
- 1984 - IBM PC AT and EGA video. First CD-ROM by Philips. HP LaserJet 1. X Window System written in MIT and Tetris in Moscow (Alexey Pajitnov on Elektronika-60)

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- 1985 - official Windows 1.0. Steve Jobs founds NeXT
- 1987 - Sun SPARC, PC 386/20. Windows 2.0 and Win/386. MS and IBM cooperate on OS/2. VGA graphics
- 1988 - 386DX and SX chips. SCSI specification. HP DeskJet inkjet printers. Creative Labs founded (the makers of SoundBlaster sound cards)

Nineties

- 1991 – Business ban lifted on Internet. A guy named Linus - “a new Unix-like operating system”. Microsoft fuses Windows to OS/2 know-how and gets NT 3.0. SunOS becomes Solaris. PCI bus standard. First colour scanner from HP
- 1992 - Win 3.1. Bill G. becomes the wealthiest person in the US
- 1993 - Intel Pentium. CD-R by Pinnacle Micro. MS NT 3.1. Plug-and-Play. FreeBSD, OpenBSD and NetBSD
- 1994 - Win 3.11, NT 3.5 (workstation + server) and the final MS-DOS - 6.22. Netscape 1.0. IBM, Apple and Motorola conspire against MS. ZIP disk from Iomega. The Pentium bug in 2 M chips. First working draft (0.7) of USB

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- 1995 – The Browser Wars start (MS proposal to Netscape). Intel P6 (Pentium Pro). MS Win 95, Office 95 and NT 3.51. DVD
- 1996 – Office 97 and NT 4.0. First usable IE - 2.0
- 1997 – first monopoly related court cases for Microsoft
- 1998 - Pentium II, Win 98. Netscape loses the war against MS, bought by AOL. Browser source opened → Mozilla etc. iMac brings Apple to profit again. USB 1.1. The dotcom boom
- 1999 - Pentium III and Athlon. MS court battles go on. Win 2000
- 2000 – Chips pass 1GHz. Win ME. DivX. WordPerfect Office for Linux. USB 2.0. DVD drives spread. No Apocalypse...

New century

- 2001 – Chips pass 2 GHz. MS Windows XP, Office XP and “Licensing v6” aka “your software is not yours”. Linux starts to challenge Windows in some places. OS X restarts the Apple. Openoffice.org created from StarOffice.
- 2002 - Wireless boom. Intel Macs. Developing countries discover FLOSS. In Estonia, an arrogant campaign by BSA creates many new Linux users. The next Windows started (planned for 2003)

2003

- Windows 2003 Server, Longhorn (later Vista) delayed
- Rapid spread of both wired and wireless networks, but also its dark side starts to show
- 2 years old OO.o challenges MS Office in public sector (also in Estonia)
- Skype founded in Tallinn. The SCO court case starts. A short-lived GPRS boom in Estonia. Linux 2.6 kernel series, a large step ahead

2004

- Software patent wars in EU. New cheaper broadband. Linux distros move to 2.6 kernel
- Windows XP SP2 has issues, still no Longhorn
- Cybersecurity problems widen, emergence of Internet racket and other “user hacking” phenomena

2005

Software patents defeated in EU

- Longhorn promised for early 2006
- Ubuntu takes the Linux world by storm
- Google buys a small company named Android Inc and launches YouTube
- Firefox starts to bypass IE

2006-7

- 2006 – another patent war in EU (defeated again), Microsoft cooperates with Novell (Linux users alarmed). OLPC by Nicholas Negroponte. MacBook Pro and iMac from Apple. Vista is still delayed
- 2007- Windows Vista and MS Office 2007. April riots and cyber attacks in Estonia. SCO defeated in court. The worst competitor for Vista is… XP . Open Handset Alliance founded by Google

2008

- MS OOXML vs ODF document wars. MS announces ODF support in Office 2007 SP2
- Bill Gates gives up full-time work in Microsoft. XP gets several extensions but is finally drawn from the market – but Vista gets increasing comparison to ME
- The Georgian War with a lot of cyberattacks. Apple creates iPhone OS (later iOS), iPhone is a huge hit

2009

- Microsoft releases Windows 7. Rise of Android. OSX drops support to earlier PowerPC architecture
- Bitcoin introduced
- Another attempt to revive the SCO case
- IT College goes to Estonian software: Estobuntu in the labs

2010

- Apple iPad defines the tablet. Google “hacked by Chinese”, threatens to leave. Denmark mandates free file formats in government
- Microsoft promotes CodePlex. Oracle obtains Sun, free projects forked (LibreOffice, MariaDB). Android becomes No 1 in mobile systems

2011

- Windows XP finally drops under 50%. Microsoft partners with Nokia. Death of Steve Jobs
- Linux world has problems with new user interfaces (Unity, Gnome 3). LibreOffice 3.4 released, Oracle drops OO.o (finally goes to Apache Foundation)

2012

- IT world also hit by economic crisis. Quad-core chips. Microsoft introduces Windows 8 and Surface. Samsung-Apple duel
- Mint passes Ubuntu in Linux world (largely due to MATE and Cinnamon). UEFI boot creates problems for Linux
- 1 billion users of Facebook
- Curiosity reaches Mars
  - Still no Apocalypse...

2013

- New buzzwords: cloud, Big Data and infosec
- Windows 8 continues the trend “every second Windows version is (somewhat) usable”
- End of MSN. Steve Ballmer resigns from MS
- Sometime around here, Google Chrome acquires the top position in the browser market
- Estonians go to space (ESTCube)

2014

- Microsoft develops Windows 9 (8 and 8.1 are considered disappointments)
- Year of Big Bugs (Heartbleed, Shellshock, POODLE)
- Steam returns Linux as a gamng platform
- The world is restless, cybersecurity rules

2015

- Windows 10 released (for many, for free) – but manages to raise so many privacy issues that many people consider moving away
- Apple Watch, the most successful smart watch so far
- The U.S. decides for Net Neutrality

2015-6

- Windows 10 reaches the first anniversary… and decides to blow up dual-boot machines. A lot of angry geeks
- MIT scientists create a five-atom quantum computer assumed to be able to overcome modern security schemes
- All over the world, sizable numbers of (seemingly) normal people wander around, hunting Pokemons

2017

- Cyberwar in Ukraine (Petya, NotPetya)
- Internet of Things ==> Internet of Bad Things
- Net Neutrality revoked in the U.S. (the fight goes on)
- WannaCry ransomware grabs more than 230 000 Windows machines
- Equifax breach, 143M accounts leaked
- The first serious public questioning of the Estonian ID card

2018

- Meltdown and Spectre vulnerabilities discovered in Intel processors
- Cambridge Analytica and Facebook
- EU and GDPR
- Net Neutrality fights continue in the U.S.
- Github => Microsoft, Red Hat => IBM
- Cryptocurrency mining a rising trend in malware

2019

- Huawei accused of leaking information to Chinese government
- Google+ and Yahoo! Groups closing down
- Google starts drone-based delivery of packages in some locations (in the U.S. a FAA certificate is required)
- Hot topics include security, privacy, (Big) data mining, and artificial intelligence

For additional reading

- Levy, *Hackers: the Heroes of the Computer Revolution*
- Freiberger & Swaine, *Fire in the Valley: the Making of Personal Computer*
- Gates & Myrhvold, *The Road Ahead*
- Carlton, *Apple*
- Vise, *The Google Story*
- Moody, *Rebel Code: Inside the Open Source Revolution*
- Dear, *The Untold Story of the PLATO System and the Dawn of Cyberculture*

Thanks