Biography of a software engineer - Grace Hopper

Grace Hopper was a US Naval Officer, and a trailblazer in the field of Computer Science.
Born in 1906 in New York, her mother enjoyed mathematics and passed down that love to her child. Growing up, she built and disassembled things to understand how they worked. Her interest in the sciences and maths was clear from a young age.
She attended Vassar University, NY, and earned a Bachelor's in mathematics and physics. She then earned a master's degree and a Ph.D. in mathematics from Yale in the 1930's.

She taught as a professor of mathematics in Vassar University, where she attained the respect and admiration of her students. " Her innovative and gregarious nature made her classes popular; in one course she invented an entire mythical country to literally "animate" a dry mechanical drawing class."(1) She had unusual methods of teaching, as she was known to start some classes with a final exam to show students exactly what they were expected to learn.

In the 1940's when the US entered WWII, Hopper wanted to join, unfortunately she was too old, and too light to enlist. However in 1943 women were enlisted to relieve men stationed at sea. She convinced them to ignore her age and joined the Women Accepted for Voluntary Emergency Service. She graduated from her program with top grades and due to her extensive education she was assigned to the Bureau of Ordnance Computation Project. There she helped design tables for firing naval weaponry.

She was hired in 1944 to program the IBM Mark 1 in Harvard University. "The IBM Automatic Sequence Controlled Calculator (ASCC), called Mark I by Harvard University's staff,[1] was a general purpose electromechanical computer that was used in the war effort during the last part of World War II."(2)
She also wrote a manual to help others operate the computer.

After WWII, Hopper went on to work on the Mark II and Mark III. During this time she coined the term ‘bug’, this happened when the Mark II malfunctioned, they pulled a moth out of the machine. This started a joke among the programmers that whenever the computer malfunctioned that it has a bug in it.

In 1940 Hopper joined Eckert-Mauchly Computer Corporation and in the early 50’s while developing the Universal Automatic Computer (UNIVAC I), the first commercial electronic computer, she introduced the idea of ‘automatic programming’ and investigated new ways to make computers code. In 1952 she created the first compiler A-0. It translated mathematical code into machine code - which greatly contributed to the future of programming.

In 1953, Hopper had the idea of writing programs with words, instead of the notation being used at the time. She was told her idea wouldn’t work but she continued to work on a compiler to compile English to machine code. In 1956 her team was running FLOW-MATIC, the first programming language to use word commands. FLOW-MATIC was designed for data processing purposes. This was not exclusive to the English language, she demonstrated that other languages could also be used.

At the time computers were being marketed to companies so allowing people without a firm grasp on computer science or maths to be able to use computers was essential. In a 1980 interview Hopper explained, “What I was after in beginning English language [programming] was to bring another whole group of people able to use the computer easily…I kept calling for more user-friendly languages. Most of the stuff we get from academicians, computer science people, is in no way adapted to people.”[3]

In 1959, she joined a company dedicated to developing a ‘common business language’, from this COBOL was born. COBOL was the most extensively used programming language in the world for a long time and

is still used to this day. “COBOL is still widely used in legacy applications deployed on mainframe computers, such as large-scale batch and transaction processing jobs.”(4) However it is declining in popularity.

During this time she was serving in the US Navy, she retired as a rear admiral at age 79, as the oldest serving officer in the US armed forces.

Hopper was the recipient of many awards during her life, In 1972 she received Yale’s Wilbur Lucius Cross Medal awarded to outstanding alumni. In 1973 she became the first woman to become a Distinguished Fellow of the British Computer Society. In 1991, Hopper was granted the National Medal of Technology. In 1969, the Data Processing Management Association awarded the first Computer Science Man-of-the-Year Award to Hopper. In 1996, the Navy commissioned the USS Hopper, an Arleigh Burke-class guided missile destroyer and in 2016 she was awarded the Presidential Medal of Freedom for her work in the field of Computer Science.

References:
(1)http://vcencyclopedia.vassar.edu/alumni/grace-murray-hopper.html
(2) https://en.wikipedia.org/wiki/Harvard_Mark_I
(3)https://president.yale.edu/biography-grace-murray-hopper
(4) https://en.wikipedia.org/wiki/COBOL