Dennis Ritchie

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Dennis Ritchie is revered by many as the Godfather of programming. As the creator of the C programming language and co-creator of the Unix operating system, it is extremely easy to understand why he would be revered as so. The influence of the C programming language to provide a system level language to replace assembly language in writing operating systems can be seen throughout many modern programming languages including Java, C++ and Python. The imperative, structured programming as well as the syntax of these languages all have borrowed elements from the C programming language.

**Early Life**

Dennis Ritchie was born on September 9th, 1941 in Bronxville, New York to Jean McGee Ritchie and Alistair E. Ritchie, he later moved to Summit, New Jersey where he finished his High School education. His father was a longtime scientist at what is now the prestiguous Bell Lab’s, he also co-authored “The Design of switching Circuits”. Dennis proceeded to go to Harvard University where he graduated with an undergraduate degree in Physics in 1963 and a degree in Applied Mathematics in 1968. Ritchie noted in his biography for Bell Labs that “My undergraduate experience convinced me that I was not smart enough to be a physicist, and that computers were quite neat, my graduate school experience convinced me that I was not smart enough to be an expert in theory of algorithms and aslo that I liked procedural languages better than functional ones.”

**The Multics Operating System**Dennis followed his father into working in the Bell Labs in 1967 in their computing sciences research center where he began working on the “Multics” project. Multics (Multiplexed Information and Computing Service) was an early time-sharing operating system that heavily influenced all modern operating systems either through Unix or the Windows NT operating system. The time-sharing philosophy of an operating system was an emerging paradigm that is used by all modern operating systems, time-sharing allows multiple users to utilise the hardware of what at the time was very ineffiecient computers that often were left idol waiting for more user input to proceed with the program, time-sharing allowed multiple users utilise the hardware during these times. Multics also was the first operating system to implement a hierarchal file system.

**The UNIX operating system and the C language**  
Bell Labs ultimately pulled out of the Multics operating system in 1969 and thus Dennis’s contributions to it ceased. Dennis and his life long colleague Ken Thompson then began to work on what would come to be the Unix operating system in 1970. The Unix operating system was initially born from Thompson wanting to translate a game he had wrote on to a new machine. Dennis began working with Thompson and a team on the Unix system, they were frustrated by the size and complexity of the Multics system and decided that they liked the idea of what the operating system was trying to achieve but not how it was trying to achieve it. They sought to integrate simple programs that they used regularly as researchers as services on an operating system that time shared between many users who communicated with it through a terminal.   
  
Dennis worked on creating a compiler for BCPL during his time on working on the Multics mainframe. His colleague Thompson had adapted BCPL to a new language he called “B” that they were considering writing the operating system in at the time. The team were migrating from using a PDP-7 mini computer to a PDP-11 minicomputer at the time and ran into issues with the “B” language and the different compatibilities of the two machines, including byte addressibility. This led Dennis to add new data types, data structures and syntax to the language creating the new language “C”, the successor of “B”.   
  
They began rewriting the Unix system using their new language and according to Ritchies close colleague Thompson “the language grew up with one of the rewritings of the system and, as such, it became perfect for writing systems.” The significance and importance of the C language is very rooted in this idea that it was created for operating system design as well as having in the past to rewrite operating systems for new devices, C and the Unix system was created with the aim of having the least amount of modifications needed so that it would work with new machines. Ritchie’s contributions to Research Unix at the time was namely the language and the system’s porting to different machines and platforms. Ritchie was famous for his modesty stating that many of the improvements they made to the language and the operating system just seemed like “a good thing to do” and defended that anyone in his position would have done the same. In 1975 the first Unix source license was sold to Donald Gillies at the University of Illinois, after this the interest and influence of Unix became widespread within academic circles and commercial start ups with companies such as AT&T and Sun Microsystems releasing versions of Unix in the 1980’s. In 1978 the book “The C Programming Language” authored by Dennis was released and will go down in history as one of the most influential programming books of all time having introduced the “hello, world” program as a minimal demonstration of the language. Today beginner programmers will be very familiar with this phrase and program as for many it is the very first program they will ever write. During the 1990’s Unix-like systems such as Linux and BSD distributions were collaborated on by a global network of enthusiastic programmers. What was originally started as Unix by Dennis Ritchie and Ken Thompson grew to become many different operating systems that can be found today such as Linux distributions and Mac OS X operating system. Ritchie continued to work on Unix operating system projects such as Plan 9 and Inferno until his retirement in 2007. Dennis Ritchie died at the age of 70 on October 12th, 2011. He was found dead in his home after battling heart disease and cancer for many years.

**Awards**  
Over his career Dennis accumulated multiple awards for his contribution to computer science and particularly operating system design. He and Thompson were awarded the 1983 Turing Award for their work on the Unix operating system and for the creation of the C programming language now used for the Unix system. In 1997 Dennis and Ken were made fellows of the Computer History museum also for their creation of Unix and the C programming language. In 1999 Dennis and Ken also won the 1998 National Medal of Technology from Bill Clinton also for Unix and C but also the medal citated “led to enormous advances in computer hardware, software and networking systems and stimulated growth of an entire industry, thereby enhancing American leadership in the Information Age.” In 2005 the Industrial Research Institute awarded Ritchie its Achievement Award for his contribution to science and technology and society in general. Finally, in 2011 Ritchie and Thompson were awarded the Japan prize for Information and Communications for their work on the the Unix operating System.

**Legacy and Influence**

The influence Dennis Ritchie made on modern advancements in information technology is unquestionable, his creation of a platform for which software and operating systems could be created on sprung the technology industry in a direction of open source, transparent and portable software that allowed for easy transferability of software on to advancements in hardware. After the licenses were sold to professors in universities, Unix and C became staple subjects for computer science students at the time and as such the industry reflected this. The legacy of the sample program “hello, world” has survived to this day and owes itself to Ritchie and “The C Programming Language” book that he authored and has become a staple program to run to verify a languages correct interpretation of the program as well as to demonstrate simple language syntax. Dennis Ritchie’s death came at a similar time to Steve Job’s death, the co-founder of technology company Apple Inc. Unlike Steve Job’s death, Dennis’s death wasn’t well recognised in the media or on the internet at the time and sparked outcry and rage within fanatical communities online which is where I first learned about Dennis Ritchie. I have since realised why those who knew of Ritchies’ contributions would be disappreciative of this lack of attention as well as also realising why there was this lack of attention, Dennis laid a foundation for which software could be built on at a time where those interested in computers were researchers and academics, that is computers served very little entertainment purposes to those without knowledge or training with them. This differs from an entrepeneur who used this foundation to build products to bring entertainment to consumers. For those who know Dennis, namely those with an interest in computer science, the work he has done for the world with his creations was arguably the most important step for modern information technology, for those who don’t, they need only accept that his work can be seen in almost any computing device.