Lecture 1:

History of C++

1.1 History of UNIX

1.1.1 Multics (1960)

The history of UNIX dates back to the mid-1960s when the Massachusetts Institute of Technology, AT&T Bell Labs, and General Electric were developing an experimental time sharing operating system called **Multics** (Multiplexed Information and Computing Service) for the GE-645 mainframe. It was originally written by two ex-programmers from the older project, **Ken Thompson** and **Dennis Ritchie**. Multics introduced many innovations, but had many problems.

Ken Thompson and Dennis Ritchie

1.1.2 UNIX (1970)

Bell Labs, frustrated by the size and complexity of Multics but not the aims, slowly pulled out of the project. The UNIX operating system was conceived and implemented by **Ken Thompson** and **Dennis Ritchie** (both of AT&T Bell Laboratories) in 1969 and first released in 1970.

Later they rewrote it in a new programming language, **C**, to make it portable. The availability and portability of UNIX caused it to be widely adopted, copied and modified by academic institutions and businesses.

The design and features of Multics greatly influenced the UNIX operating system. The name UNIX (originally Unics) is itself a pun on Multics. The U in UNIX is rumoured to stand for uniplexed.

1.1.3 The UNIX war (1980)

For the first 10 years, UNIX development was essentially confined to Bell Labs. These initial versions were labelled "Version n" or "Nth Edition" (of the manuals). Although UNIX was proprietary, source code was available, which encouraged customers to make modifications to their systems. One such customer was the University of California at Berkeley's Computer Systems Research Group. Their version of UNIX was known as the Berkeley System Distribution (**BSD**).

BSD, from the University of California, Berkeley, and **System V**, from AT&T Corporation. Both were derived from the earlier **Version 7 Unix.**

1.1.4 History of FSF and GNU (1980)

What Ritchie and Thompson began in a distinctly non-commercial fashion ended up spawning several legal squabbles. When AT&T grasped the commercial potential of UNIX, it claimed UNIX as its intellectual property and began charging a hefty licensing fee to those who wanted to use it. Soon, others who had implemented Unix-like operating systems were distributing licenses only for a fee. Understandably, those who had contributed improvements to UNIX considered it unfair for AT&T and others to appropriate the fruits of their labours. This concern for profit was at odds with the democratic, share-and-share-alike spirit of the early days of UNIX.

As a result **Richard Stallman** founded Free Software Foundation (FSF) as a non-profit organization on 4 October 1985 to support the free software movement, which promotes the universal freedom to study, distribute, create, and modify computer software, with the organization's preference for software being distributed under copyleft ("share alike") terms such as with its own GNU General Public License. The GNU projects own kernel development project, GNU Hurd, had not produced a working kernel.

1.1.5 MINIX

MINIX (from "mini-Unix") is a Unix-like computer operating system based on a microkernel architecture. Early versions of MINIX were created by Andrew S. Tanenbaum for educational purposes. MINIX was first released in 1987, with its complete source code made available to universities for study in courses and research.

1.1.6 History of Linux (1990)

The design principles Tanenbaum applied to MINIX greatly influenced the design decisions Linus Torvalds applied in the creation of the Linux kernel. Torvalds used and appreciated MINIX, but his design deviated from the MINIX architecture in significant ways, most notably by employing a monolithic kernel instead of a microkernel.

In **1991 Linus Torvalds** released the Linux kernel as free software under the GNU General Public License. In addition to their use in the Linux operating system, many GNU packages – such as the GNU Compiler Collection (and the rest of the GNU toolchain), the GNU C library and the GNU core utilities – have gone on to play central roles in other free Unix systems as well.

1.2 History of C

The C programming language was developed at Bell Labs during the early 1970's by **Dennis Ritchie**. It was derived from a computer language named **B** and from an earlier language **BCPL**.

1.3 History of C++

C++ was written by Bjarne Stroustrup at Bell Labs during 1983-1985. C++ is an extension of C. Prior to 1983, Bjarne Stroustrup added features to C and formed what he called "C with Classes". He had combined the Simula's use of classes and object-oriented features with the power and efficiency of C. The term C++ was first used in 1983.

1.3.1 Standardization

C++ is standardized by an ISO working group.

Year	C++ Standard	Informal name
1998	ISO/IEC 14882:1998[12]	C++98
2003	ISO/IEC 14882:2003[13]	C++03
2007	ISO/IEC TR 19768:2007[14]	C++TR1
2011	ISO/IEC 14882:2011[4]	C++11
2014	N3690 (working draft C++14)[15]	C++14
2017	to be determined	C++17

C++11 includes several additions to the core language and extends the C++ standard library, incorporating most of the C++ Technical Report 1 (TR1) libraries — with the exception of the library of mathematical special functions. C++11 was published as ISO/IEC 14882:2011[4] in September 2011 and is available for a fee.