

ICT Innovators

Pioneer of Computer Programming

Dr. Grace Hopper

1906–1992

Dr Grace Hopper was a mathematician and rear admiral in the US Navy. She began her career as a mathematics professor at Vassar College before joining the Navy in 1943. She was assigned to a computational project in 1944 where she worked on Mark I, the first large-scale automatic calculator which would go on to be a precursor to modern computers.

She helped create ways to program computers using plain English, including COBOL (COmmon Business-Oriented Language), a computer code many business operations still rely on today.



“

I’ve always been more interested in the future than in the past.

Grace Hopper

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Some day, on the corporate balance sheet, there will be an entry which reads, ‘Information’, for in most cases, the information is more valuable than the hardware which processes it.

Ada Lovelace

Fast facts

Awarded the **National Medal of Technology** in 1991 and the Presidential Medal of Freedom posthumously in 2016



101010101
10101

Developed one of the first **programming languages** that understood English commands



Retired in 1986 at 79 years, as the **oldest officer** on active duty in the **US Navy**

Named the first computer science **‘Man of the Year’** by the Data Processing Management Association in 1969



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Activity: Coding your name with a compiler

A compiler is a program used in digital systems to turn words that humans can understand into a code that a computer can understand.

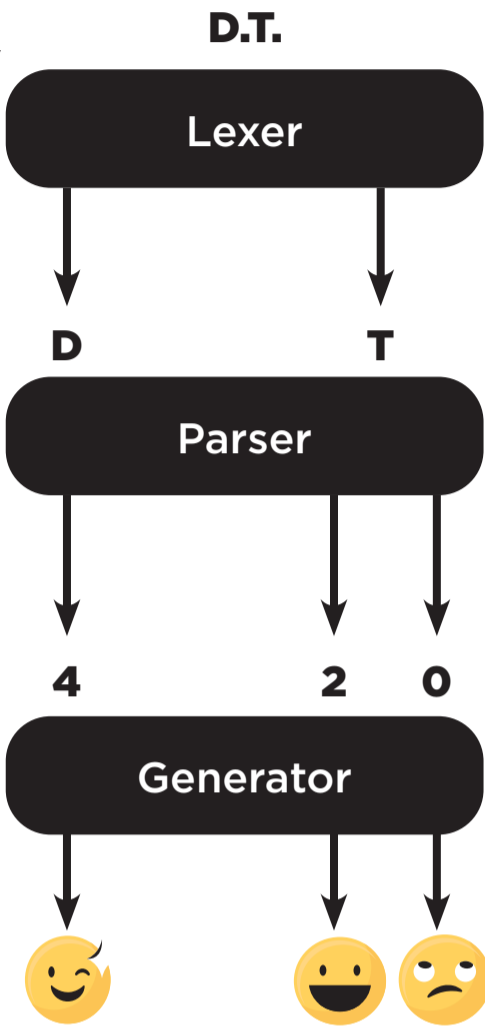
How does a compiler work?

Enter the text you want to code

Splits the letters up

Assigns a number to each letter based on where they sit in the alphabet

Turns the numbers into a code the computer can read



Compiling Activity

1. Compile your initials into a secret emoji code
2. Give the emoji code to your partner and see if they can decode it



Challenge

Can you code a secret message to your friend for them to decode?

Algorithmic Thinking

Sometimes different letters can produce the same combination of emojis. How could we improve the compiler to make a unique code every time?

In actual computers, code can only be understood in binary. Compilers turn code into 1s and 0s for the computer to understand.



→ Compiler → 1010110101010101
10101

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Activity: Coding your name with a compiler

A compiler is a program used in digital systems to turn words that humans can understand into a code that a computer can understand.

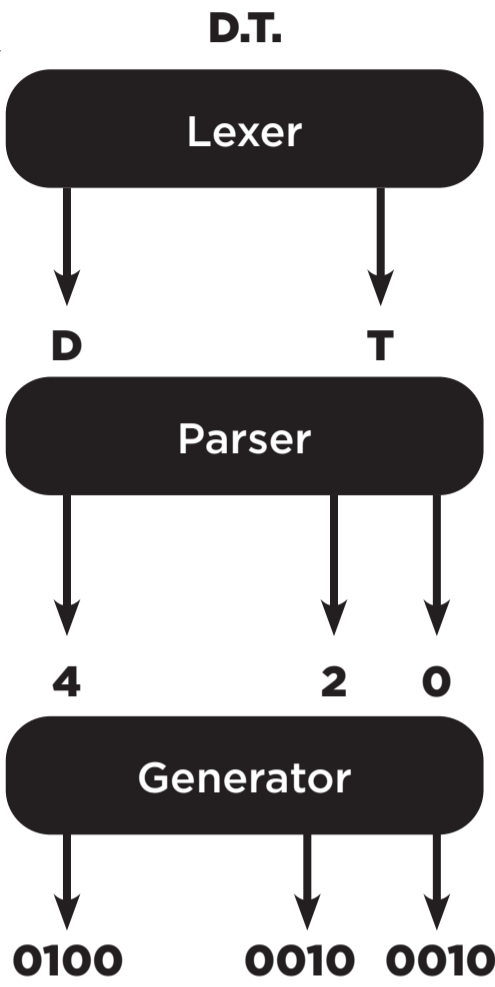
How does a compiler work?

Enter the text you want to code

Splits the letters up

Assigns a number to each letter based on where they sit in the alphabet

Turns the numbers into a binary code using 1's and 0's the computer can read



Compiling Activity

1. Compile your initials into a binary code
2. Give the binary code to your partner and see if they can decode it use the binary chart below to create your code

0000	0	1000	8
0001	1	1001	9
0010	2	1010	A
0011	3	1011	B
0100	4	1100	C
0101	5	1101	D
0110	6	1110	E
0111	7	1111	F

Challenge

Can you code a secret message to your friend for them to decode?

Algorithmic Thinking

Our compiler is creating binary code using an 8 bit system. How many bits should we use to make every letter in the alphabet a unique binary code?

In computers, code can only be understood in binary. Compilers turn code into 1s and 0s for the computer to understand. Compilers can be 8bit, 16bit or 32bit all creating different codes for different types of programming needs.