# Introduction to C Programming

by SAHIL

# The Evolution of C


Dennis Ritchie, Creator of C

**Sir Dennis Ritchie**

- American computer scientist

**1960** Algol (International Group)

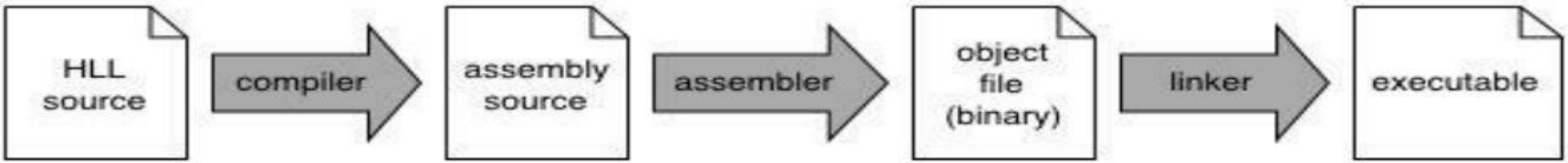
**1967** BCPL (Martin Richards)

**1970** B Language (Ken Thompson)

**1972** Traditional C (Dennis Ritchie)

**1989** ANSI C (ANSI Committee)

# The compilation process




- To produce assembly code: `gcc -S test.c`
  - produces `test.s`
- To produce object code: `gcc -c test.c`
  - produces `test.o`
- To produce executable code: `gcc test.c`
  - produces `a.out`

- **HLL Source (.c) → C program written by the programmer.**
- **Compiler → Converts C code into Assembly code.**
- **Assembly Source (.s) → Low-level assembly instructions.**
- **Assembler → Converts assembly code into Object/Binary code.**
- **Object File (.o) → Machine code, but not yet a complete executable.**
- **Linker → Combines object code with required library code.**
- **Executable (.out) → Final program that can be run/executed.**

# Applications of C Programming

1. **Operating Systems** – Windows, Linux, Unix
2. **Embedded Systems** – Microcontrollers, IoT devices
3. **System Software** – Compilers, drivers
4. **Game Development** – Game engines and graphics
5. **Database Systems** – Database management software
6. **Networking** – Network protocols and applications
7. **Scientific Applications** – Simulations and calculations
8. **Device Drivers** – Hardware communication
9. **Robotics** – Robot control systems
10. **Cybersecurity** – Security tools and low-level programs

# Important Features of C

1. It has rich set of built-in functions and operators.
2. It is used for writing both system software (Operating systems) and application software.
3. Due to variety of data types and powerful operators, the programs in C are efficient and faster.
4. There are only 32 keywords in ANSI C.
5. It is a highly portable language.

# Important Features of C

6. C language provides a platform for structured programming through the use of function modules or blocks. This makes program debugging, testing and maintenance easier.

7. It has an ability to extend itself. This means we can add our own functions to library.

# Special Characters

| Symbol | Name of Symbol |
| --- | --- |
| # | Hash |
| < > | Angle Brackets |
| ( ) | Parentheses |
| { } | Braces |
| ; | Semi-Colon |
| : | Colon |
| “ ” | Double-Quotes |

# Special Characters

| Symbol | Name of Symbol |
| --- | --- |
| ‘ ’ | Single-Quotes |
| , | Comma |
| * | Asterisk |
| [ ] | Bracket |
| & | Ampersand |

# Sample Program: Hello World

```
#include <stdio.h>

main()
{
   printf("I say, C is wonderful.");
}
```

# Header File

1. #include is a *preprocessor directive* used to include *header files* in the program.
2. stdio stands for Standard Input Output Library.
3. In this Library Various Input Output functions are Available.
4. Inclusion of Header file takes the General form as,

#include<File Name>

# Function



# Main() Function

1. The main ( ) is a special function used by C system to tell the computer where the program starts.
2. In other words it is also called as Entry Level Function or Entry point.
3. Every program must have exactly one main function.

4. The empty pair of parentheses indicates that the function main has no arguments (orparameters).
5. The opening brace “{” indicates starting and the closing brace “}” indicates ending of the program.
6. Between these two braces actual code is present and also between this everything known as function body.

# Output Function

1. printf() is a predefined standard C function for printing the output.
2. The*printf* function print everything between the starting and ending quotation marks.
3. Here the line containing printf function ends with a *semicolon(;)*.
4. Every statement in C should end with a semicolon.
5. It takes the general form as,

printf(“texts + format specifiers + special characters”,variables);

# Output Function

**Note:**

i. C is a case sensitive language i.e. printf and PRINTF are not the same.

ii. In C everything is written in lowercase letters

# Thank You

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