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Lecture 2

Getting Started with C

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A description:

C is a compact general-purpose, imperative programming language that supports structured programming, lexical variable scope and recursion, while a static type system prevents many unintended operations.

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A short history:

C was originally developed by Dennis Ritchie between 1969 and 1973 at AT&T Bell Labs and used to re-implement the Unix operating system.

Given the name C as it succeeded an earlier programming language called B that had been introduced around 1970.

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More interesting facts:

- provides constructs that map efficiently to typical machine instructions
- therefore used in applications that had formerly been coded in assembly language, including operating systems
- platform independent
- many newer languages (C++, C#, Java) based at least in part on C

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More interesting facts 2:

- flexibility and portability made it popular
- 1989, formalised by ANSI
- ANSI exhaustively and unambiguously defined each aspect
- ANSI C now the recognised standard

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Standard C Libraries

- ANSI C defines a number of standard libraries
- libraries contain tried and tested functions that can be used in programs
- contained in “header files”
- files have extension “.h”

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Library	Description
stdio.h	Input/output functions, types and macro definitions. Used by most C programs. Comprises almost a third of entire C libraries.
ctype.h	Functions for testing characters.
string.h	Functions for manipulating strings.
math.h	Mathematical functions.
stdlib.h	Utility functions for number conversion, storage allocation etc.
assert.h	A function that can add diagnostics to a program.

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Library	Description
stdarg.h	A function that can be used to step through a list of function arguments.
setjmp.h	A function that can be used to avoid normal call and return sequence.
signal.h	Functions for handling exceptional conditions that may arise in a program.
time.h	Functions for manipulating date and time components.
limits.h	Constant definitions for size of C data types.
float.h	Constant definitions relating to floating-point arithmetic.

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Writing a C program

- C programs initially created as plain text files
- no special software necessary
- don't use a WP application!!
- must be compiled before they can be executed.
- if text file contains syntax errors, reported by compiler and executable not built.

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Installing a Compiler:

- C programs initially created as plain text files
- a compiler is used to turn C commands into byte code that can be understood by the computer
- GNU C compiler one of the most popular and available free

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Installing a Compiler: step-by-step guide

1. Launch a browser and navigate to MinGW page at https://sourceforge.net/directory/os:windows/?q=mingw
2. On projects page, click on Download button to download "Automated MinGW Installer – named something like mingw-get-inst-xxx.exe

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3. Double-click the downloaded installer and agree Licence terms

4. Accept suggested installation location at C:\MinGW

5. Click Next button to start installation

6. Launch Environment Variables dialogue in Control Panel/System, select Advanced and locate Environment Variables

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7. Find Path variable and edit end of its statement to add

;C:\MinGW\bin;

8. To prove availability of GNU C Compiler, at a Command Prompt type gcc –v and hit Return (Enter). Version Information should be displayed

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NEXT:

Writing and compiling C Programs.