Problem Solving With C - UE24CS151B

Language Specifications/Behaviors

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PROBLEM SOLVING WITH C

Language Specifications/Behaviors

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1. Language Specification
2. Standards
3. Behaviors defined by C Standards
4. Undefined Behavior in detail

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Language Specification

- A documentation that defines a programming language so that users and implementers can agree on what programs in that language mean.

- Are typically detailed and formal, and primarily used by implementers referring to them in case of ambiguity.

- Can take several forms:

  An explicit definition of the syntax and semantics of the language.

  A description of the behavior of a "translator" for the language

  "Model implementation" is a program that implements all requirements from a corresponding specification

Language Specifications/Behaviors

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Standards

de Facto: Practices that are legally recognized, regardless of whether the practice exists in reality.

de Jure: Describes situations that exist in reality, even if not legally recognized

- Language may have one or more implementations which acts as deFacto Language may be implemented and then specified, or vice versa or together.
- Languages can exist and be popular for decades without a specification - Perl
- After 20 years of usage, specification for PHP in 2014
- ALGOL 68 : First (and possibly one of the last) major language for which a full formal definition was made before it was implemented

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Behaviors defined by C Standards

- Locale-specific behavior - Not discussed here
- Unspecified behavior - Order of evaluation of arguments in printf function
- Implementation-defined behavior – Size of each type
- Undefined behavior in detail

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Undefined Behavior in detail

- The result of executing a program whose behavior is prescribed to be unpredictable in the language specification to which the computer code adheres.
- It is the name of a list of conditions that the program must not meet.
- Examples: Memory access outside of array bounds, Signed integer overflow
- Standard imposes no requirements: May fail to compile, may crash, may generate incorrect results, may fortunately do what exactly programmer intended
- Coding Examples

THANK YOU

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