MATLAB to C with MATLAB Coder

OEM: MathWorks • Code: MW-MATLAB-TO-C-WITH-MATLAB-CODER

COURSE DESCRIPTION

This two-day course focuses on generating C code from MATLAB® code using MATLAB Coder™. The focus is on developing MATLAB code that is ready for code generation, generating C code that meets optimization requirements, and integrating generated code into parent projects and external modules. This course is intended for intermediate to advanced MATLAB users.

AUDIENCE PROFILE

- IT professionals and technical staff seeking hands-on training in this course's subject area.

PREREQUISITES

- MATLAB Fundamentals and knowledge of C programming language

COURSE OBJECTIVES

By the end of this course, participants will be able to:

- Become familiar with MATLAB Coder and its applications.
- Use MATLAB Coder coding standards to write MATLAB code that is ready for code generation.
- Generate C code from MATLAB code that has fixed-size or constant inputs.
- Generate C code from MATLAB code that has variable-size inputs or local data.
- Generate C code from MATLAB code that contains persistent data, global variables, input structures, or cell arrays.
- Integrate generated C code from MATLAB Coder with external C code.
- Use various options and techniques to optimize generated code.

COURSE OUTLINE

Module 1: Day 1 of 2

Code Generation with MATLAB Coder

- MATLAB Coder overview
- Workflow for generating C code from MATLAB code

- Generating C code
- Verifying generated code
- Navigating generated code

Preparing MATLAB Code for Code Generation

- Translating MATLAB code into C code
- Calling unsupported MATLAB functions
- Preparing existing MATLAB code
- Code preparation workflows

Working with Fixed-Size Data

- Data characteristics overview
- Specifying fixed-size, top-level inputs
- Specifying constant top-level inputs

Working with Variable-Size Data

- Specifying variable-size, top-level inputs
- Specifying variable-size local data
- Reusing variables

Module 2: Day 2 of 2

Working with Global Data, Structures, and Cell Arrays

- Persistent variables
- Global variables
- Working with structures
- Cell arrays in generated code
- Passing arguments by reference

Integrating with External Code

- Code integration overview
- Entry points to generated code
- Integrating external C code using MATLAB Coder interface
- Integrating external C code using an external IDE
- Calling external C functions
- Code verification and profiling
- Source code debugging

Optimizing Generated Code

- Code optimization with loop unrolling and null initialization
- Function inlining and file partitioning
- Configuration objects
- Removing unnecessary code
- Naming conventions in generated code

- Converting a project to a script