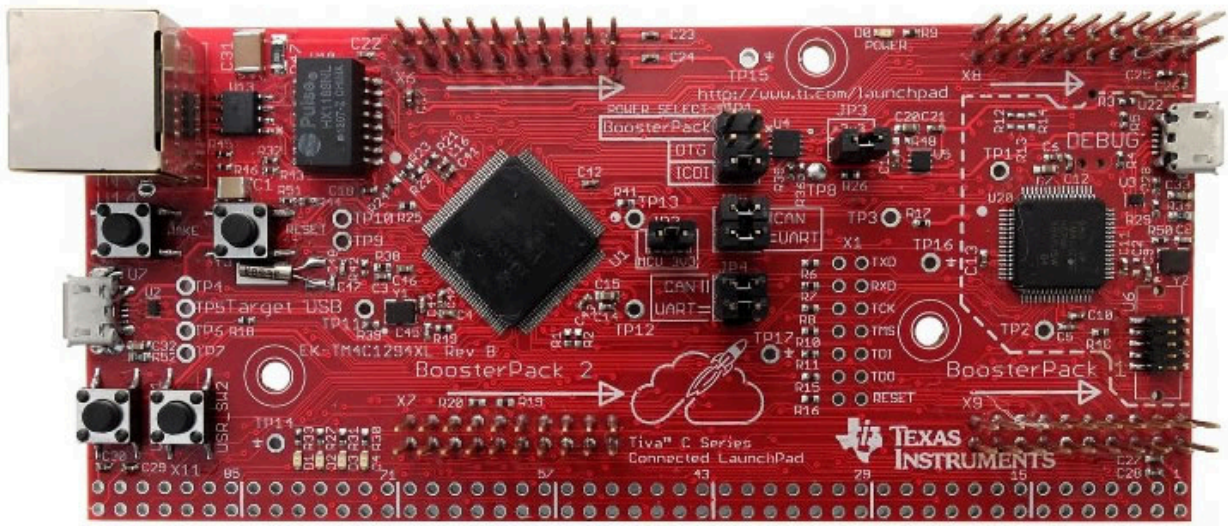

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Task 1: Integrating a Makefile into Code Composer Studio

Objective

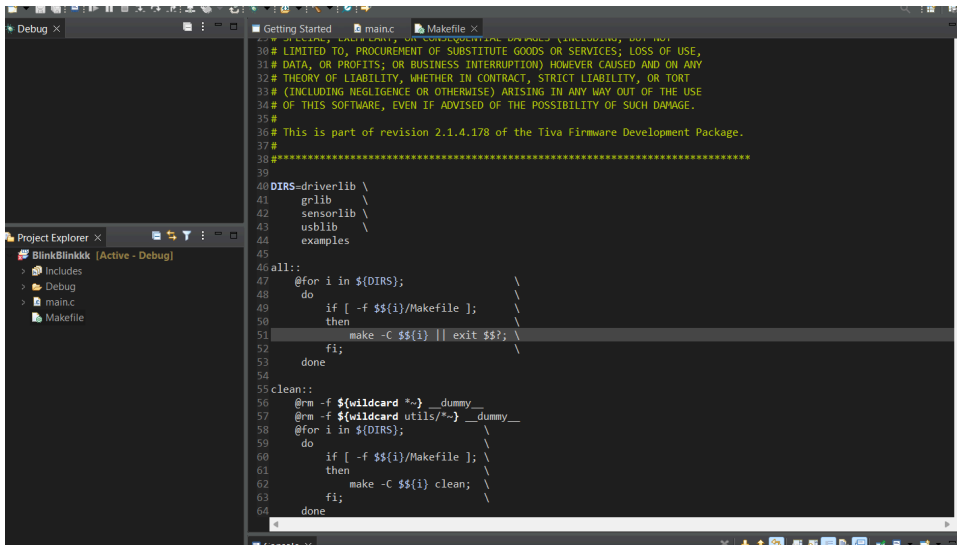
The objective is to create and integrate a Makefile into a Code Composer Studio (CCS) project for efficient build management of a C/C++ application targeting the TM4C1294NCPDT microcontroller (i'm using the TM4C1294XL development board). I couldn't find anything online & decided to create this guideline for anyone who is using this particular board.

Steps Taken

1. **Project Setup**:
    - Created a new project in Code Composer Studio tailored for the TM4C1294NCPDT microcontroller. This setup included defining the necessary source files and project configuration.
2. **Makefile Creation**:
    - Developed a Makefile to automate the build process. The Makefile was structured to include:
        - **Variables**: Defined compiler settings, such as `CC` for the compiler and `CFLAGS` for the compiler flags.
        - **Targets and Dependencies**: Specified the target executable and the object files required for its creation, detailing how each target depends on its corresponding object files.

- **Build Rules**: Established rules for compiling object files from source files, enabling modular compilation.
- **Clean Rule**: Implemented a clean command to facilitate the removal of compiled artifacts, ensuring a clean build environment.

CC: Specifies the compiler to use. In this case, it's set to `gcc`. For CCS projects targeting ARM (like the TM4C1294NCPDT), you may want to change this to something like `arm-none-eabi-gcc`.
CFLAGS: Compiler flags. `-Wall` enables all warnings, and `-g` includes debugging information.
OBJ: Lists the object files that will be generated from your source files. Make sure these correspond to your actual source files.
TARGET: The name of the final executable that will be created.

- 

3. **Importing the Makefile into CCS**:
   - Created a new file named `Makefile` within the CCS project directory.
   - Copied the contents from the previously created Makefile text file and pasted them into the new `Makefile` in CCS.
   - Saved the changes, ensuring that the Makefile was correctly formatted and free of syntax errors.
4. **Project Configuration in CCS**:
   - Accessed the project properties by right-clicking on the project in the Project Explorer.
   - Navigated to **Build** > **Builder** and configured CCS to use the Makefile instead of the default build system:

        - Unchecked the default build option and selected **Make** as the build method.
        - Set the build command to `make` and defined the clean command as `make clean`.

    - Ensured that any necessary include paths and library references were correctly specified within the Makefile.
5. **Building the Project**:
    - Initiated the build process by selecting **Project** > **Build Project** in the CCS menu.
    - Verified that CCS utilized the Makefile correctly, leading to successful compilation of the project.
6. **Testing and Debugging**:
    - After building, proceeded to test and debug the application using the standard CCS debugging tools, confirming the successful integration of the Makefile.