ECEN 489: Task 1 – Necessary Software

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Meeting Location: ZEC 321C

1   The C++ Programming Language

C++ is a popular, general-purpose programming language. It is often considered an intermediate-level language because it admits both high-level and low-level paradigms. C++ adds object-oriented programming features to C. In particular, it supports classes and their main attributes: abstraction, encapsulation, inheritance, and polymorphism. Technically, C++ incorporates the C standard library, with slight modifications. Many compilers are available for C++, including Visual Studio (Microsoft) and GCC (GNU Project). The C/C++ syntax forms the basis for software development on several microcontroller platforms.

Texas A&M University provides access to several books on C++ programming. For instance, *The C++ programming language* is accessible online through the library. This is a great resource if you need to dust off your programming skills.

2   Integrated Development Environments

An integrated development environment (IDE) is a software application that provides comprehensive tools for software development. An IDE often provides a source code editor, build automation tools, and a debugger. A major benefit of IDEs is a significant reduction in establishing proper build configurations.

The Eclipse Foundation

Eclipse is a community for individuals and organizations who wish to collaborate on commercially-friendly open source software. This project was originally established by IBM in 2001. The Eclipse Foundation was subsequently created as an independent not-for-profit corporation to act as the steward of the Eclipse community. The Eclipse IDE can be used to develop applications in Java, C++, Python and other languages. It is the primary software development environment for Android applications.

Eclipse is a powerful platform, and it can be used to program C++. We note that the modular construction of the Eclipse IDE enables the release of custom products. For example, Google offers an Android Developer Tools (ADT) Bundle based on Eclipse specifically tailored to Android programming.

Alternate Programming Environments

There are many alternate IDEs for C++ development. This includes Microsoft Visual Studio, Apple Xcode, NetBeans. In addition, code can be written in code editors such as Notepad++, TextWrangler, GNU Emacs, and Vim.

Action Items

C++ Toolchain

To build and debug a C++ projects, a toolchain is required. The standard C/C++ Development Tools (CDT) in Eclipse supports integration with the GNU toolchain, which includes the `make`, `gcc`, and `gdb` utilities. Each platform that runs the CDT requires a unique installation process.

- **Windows – Download and Install:** MinGW using the `mingw-get-inst` package and default directory.
  http://sourceforge.net/projects/mingw/files/

- **MacOS X – Download and Install:** Apple GNU toolchain included in the Xcode IDE.
  http://developer.apple.com

- **GNU/Linux:** The GNU/Linux distributions provide the GNU toolchain. Still, it may have to be install through the appropriate package manager.

Eclipse

- **Read:** About the Eclipse Foundation.
  http://www.eclipse.org/org/

- **Download and Install:** A Java Runtime Environment (JRE). This is needed to run Eclipse IDE.
  http://www.oracle.com/technetwork/java/javase/downloads/index.html

- Option 1 – **Download and Install:** Eclipse IDE for C/C++ Developers (latest release).
  http://www.eclipse.org/downloads/

- Option 2 – **Download and Install:** Eclipse Standard (latest release).
  Under `Install New Software > Programming Languages`, select the `C/C++ Development Tools` and `C/C++ Development Tools SDK` packages.

Getting Started

- **Read:** C/C++ Development User Guide.
  http://help.eclipse.org/kepler/index.jsp

- **Create, Build, and Run:** The HelloWorld application, following the tutorial.