

EE1301: Introduction to Computing Systems

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Dept. of ECE**

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Course Information

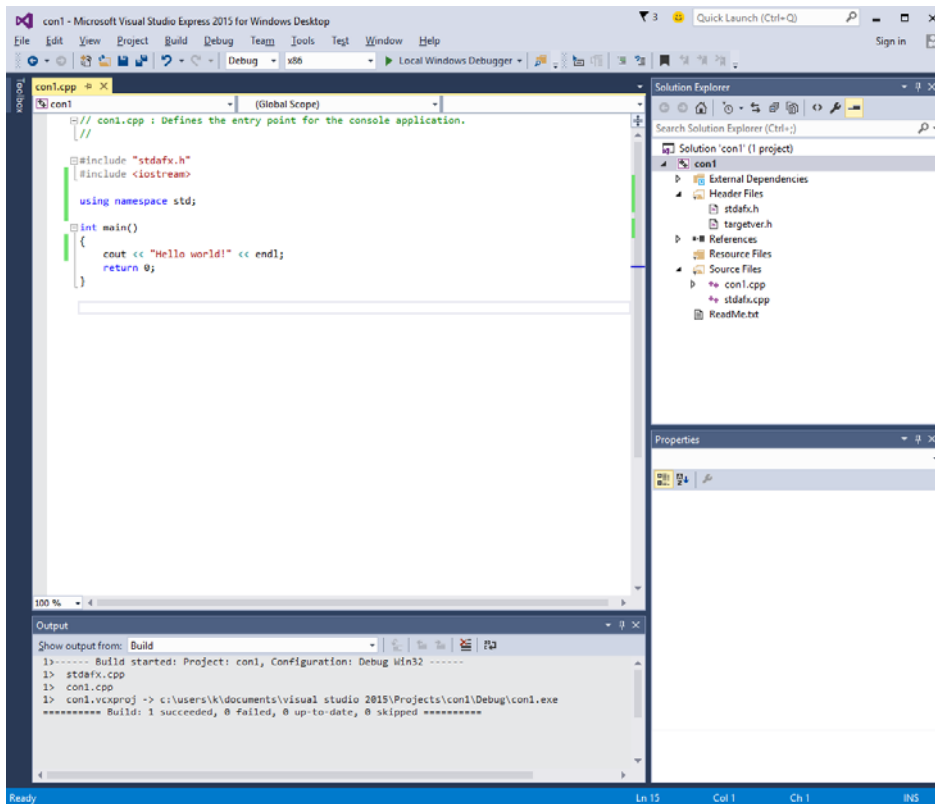
- **Class webpage**
 - ~~Login to~~ <http://moodle.umn.edu>
 - <http://umn.edu/~kia/Courses/EE1301>
- **Instructor:**
 - *Kia Bazargan* kia@umn.edu
 - Office: EE/CSci 4-159
 - Phone: (612) 625-4588
 - *Office hours*: Tue 11-noon, or by appointment

Resources

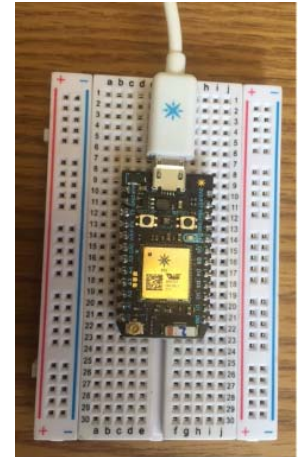
- **Textbook (neither required):**
 - Y. N. Patt and S. J. Patel, “Introduction to Computing Systems: From Bits and Gates to C and Beyond”, second edition.
 - Kernighan and Ritchie, “The C Programming Language”, 2nd Edition. (You can find it either new or used in good bookstores or from online sellers, or rent it from the usual places.)
- **C Compiler**
 - **Windows** users: go to <https://www.cs.umn.edu/dreamspark/>, get Microsoft Visual Studio
 - **Mac** users: use gcc, but instructions on how to use it are not provided in the lectures
- **Lab Kits**
 - Particle “Photon” board and miscellaneous components Available at the ECE Depot
- **Documents posted on Moodle**
 - Slides, Lecture notes, (try to do) class videos

Coding Environments

- Software programs
- Microsoft Visual Studio (windows)

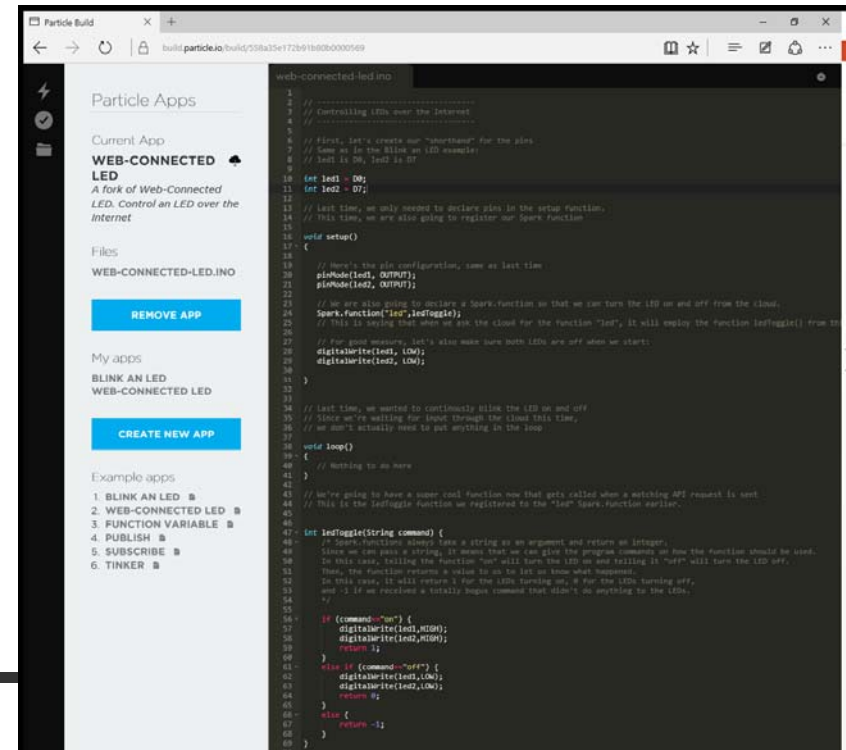


- Hardware platform
 - Photon Board (from Particle)



- Online development environment

<https://build.particle.io/build>



Setting up Compilers / Board

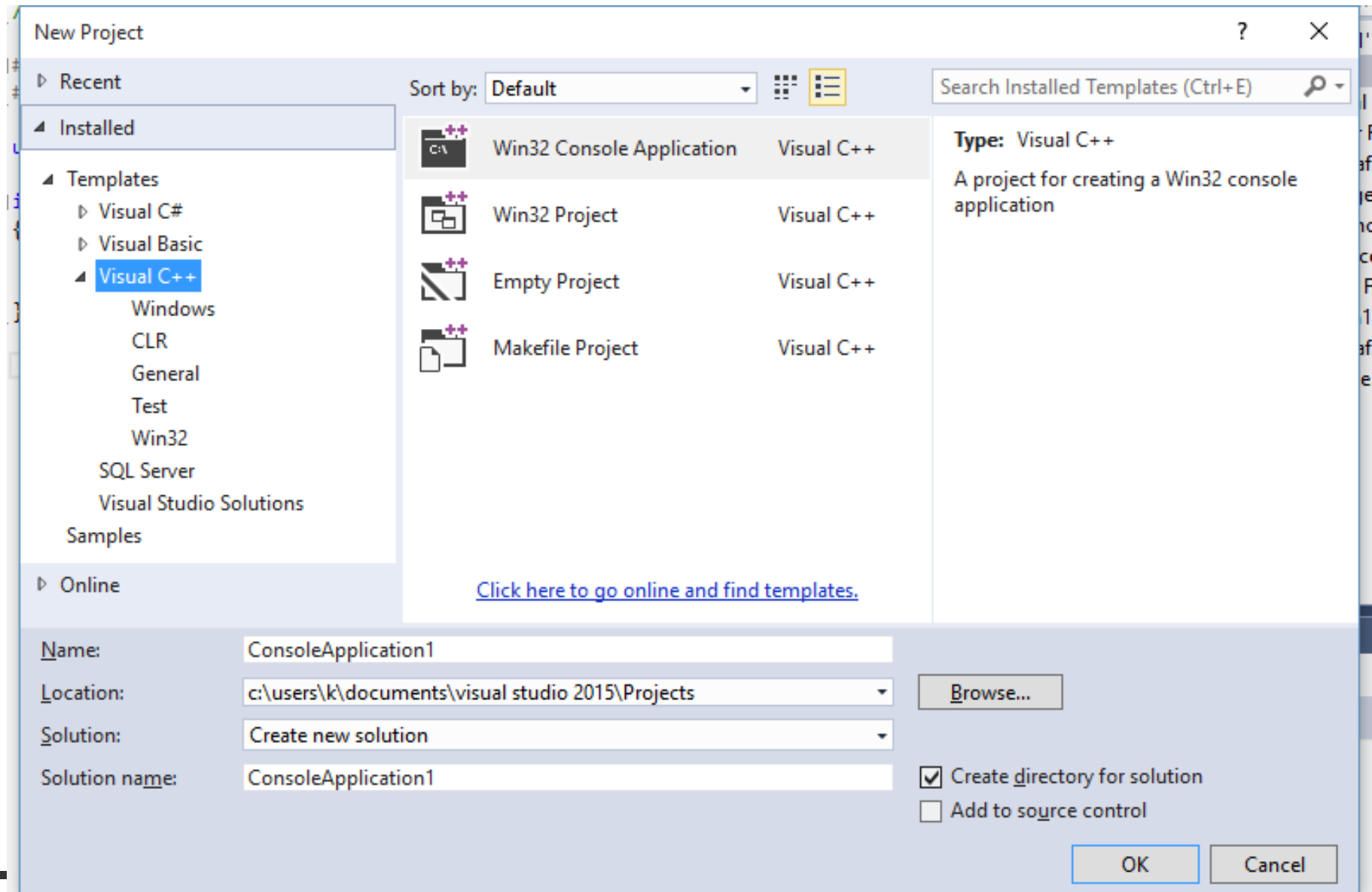
- **Software side:**
- **Install Visual Studio (Mac users talk to me)**
- **Create Project**
 - **Click on New Proj...**
 - **Choose C++ as the language**
 - **Choose Console Application**
- **Hardware labs**
 - **Lab 1 IoT manual will guide you through setting up your board**

Visual Studio: First Time Use

The screenshot shows the Visual Studio Express 2015 for Windows Desktop Start Page. The interface is divided into several sections:

- Start Page - Microsoft Visual Studio Express 2015 for Windows Desktop**: The main window title and menu bar (File, Edit, View, Debug, Team, Tools, Test, Window, Help) are visible at the top.
- Toolbox**: A vertical sidebar on the left containing the text "Toolbox".
- Start Page**: The main content area, featuring a "Visual Studio" header, a "Start" section with "New Project..." (highlighted), "Open Project...", and "Open from Source Control..." options, and a "Recent" section.
- Solution Explorer**: A panel on the right side, currently empty.
- Discover what's new in Express 2015 for Windows Desktop**: A section with links to learn about new features, the .NET Framework, and Visual Studio Online.
- Ready to Cloud-power your experience?**: A section with a "Connect to Azure" button.
- New on Microsoft Platforms**: A list of platform options: Visual C#, Visual Basic, Visual C++, Windows Presentation Foundation (WPF), and Windows Forms.
- News**: A section with a "Debugging Optimized Code" article, including a brief description and a "NEW Tuesday, September 1, 2015" tag.
- .NET Native – What it means for Universal**: A link to an article about .NET Native.

Visual Studio: First Time Use



Rough Course Overview

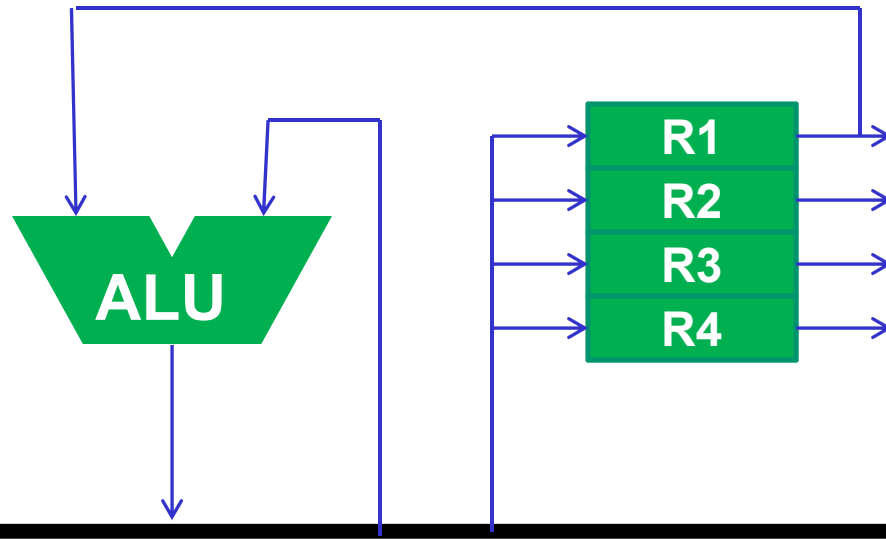
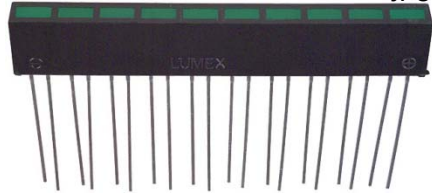
Topic	Hours	"text"
Fundamental concepts: computers, compilers	3	PP 4, 11
"Hello World" program, data types, basic arithmetic	2	KR 2, PP 12
Arithmetic Operator Precedence, Casting	1	KR 2
IF-else constructs and conditional expressions	3	KR 3, PP 13
Basic Loop Constructs (while, for)	6	KR 3, PP 13
Arrays (1D and 2D)	3	KR 5, PP 16.3
Variable addresses in memory, including 2D arrays	3	KR 5, PP 16.2
Data Structures, struct	3	KR 6, PP 19
Functions	3	KR 4
Global and local variables, array initialization	3	KR 4
Recursive Functions, File I/O	3	KR 7, 8, PP 17, 18
The C library, strings	3	KR Apdx B
Dynamic Memory Management	3	KR 8
An Introduction to Object-Oriented Programming	6	-

Grading Policy

- **Labs (25%)**
 - Primarily programming assignments
- **Final Project (15%)**
 - Either purely software-based, or embedded system (e.g., Particle boards)
- **Midterm exam (30%)**
 - In class, open book, open notes, calculators permitted
- **Final exam (30%)**
 - In class, open book, open notes, calculators permitted

A Simple "Computer"

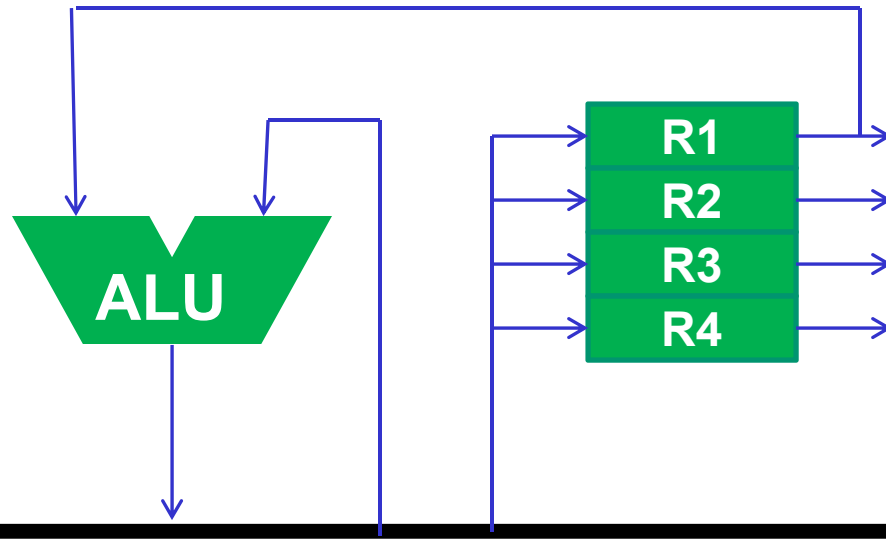
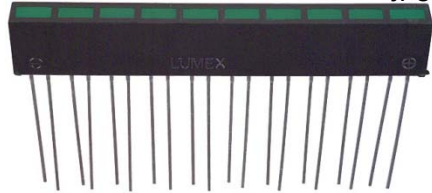
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http://www.doc.ic.ac.uk/~ih/doc/nxt-i2c/voti_switches_big.jpg

A Simple “Computer”

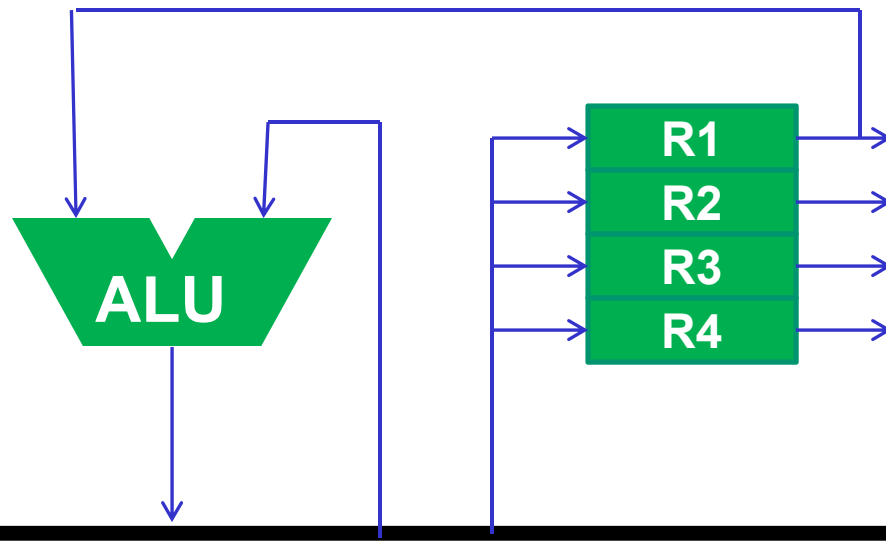
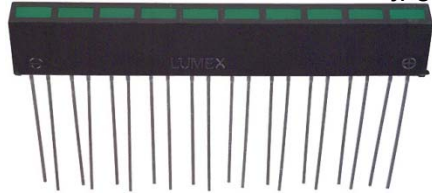
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