AUTODESK. UNIVERSITY

SD467609: Create Your First Autocad Plugin

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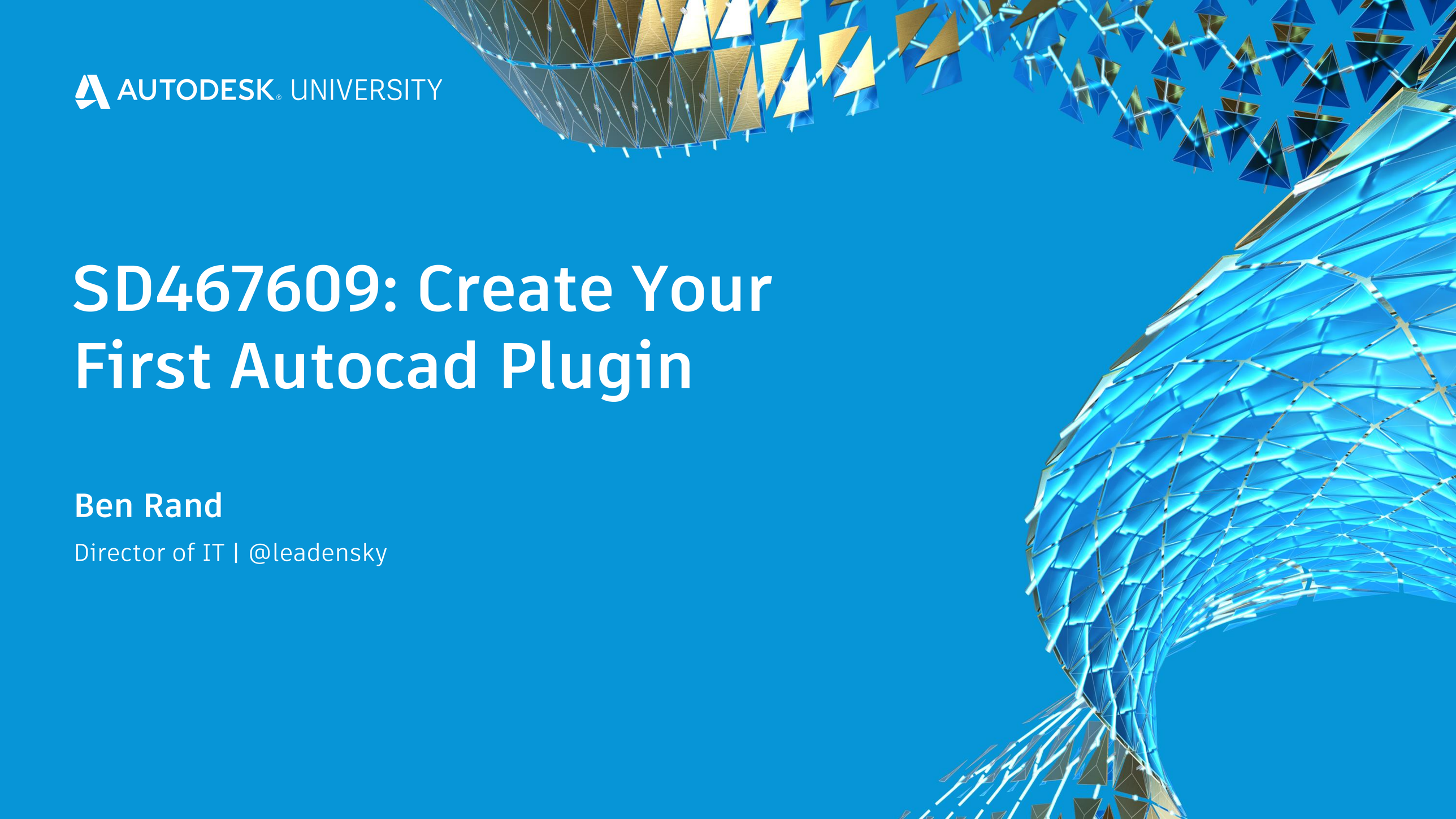
Director of IT | @leadensky



About the speaker

Ben Rand has been using AutoCAD software since R12. He learned to program using LISP in AutoCAD, worked his way up through VBA to VB.NET, and now spends most of his days programming in C# (occasionally still in AutoCAD!). He has worked in the Industrial Engineering field for more than 18 years as a CAD Manager, developer and IT Director. In 2013, he was the Top DAUG overall winner at AU, and served as a mentor for the AutoCAD Mentor All-Star team. Ben has been presenting at AU since 2015, and was honored to appear on the Top Rated Speaker list in 2017 and 2018, and is a Pluralsight Author. Ben is the proud father of four children and enjoys reading and playing a variety of sports including pickleball, volleyball, and tennis. In 2018, Ben was a member of a USTA men's league team that placed 1st in the entire country.

Prerequisites

- **Autocad**
- **Visual Studio Community Edition (or higher)**
  - https://visualstudio.microsoft.com/downloads/
- **ObjectARX SDK for your version of Autocad**
  - https://www.autodesk.com/developer-network/platform-technologies/autocad/objectarx-license-download

Course Objectives

OBJECTIVE 1

HELLO WORLD

Create a plugin for Autocad, using the C# language.

OBJECTIVE 2

LAYER CREATOR

Write focused, cohesive classes and methods.

OBJECTIVE 3

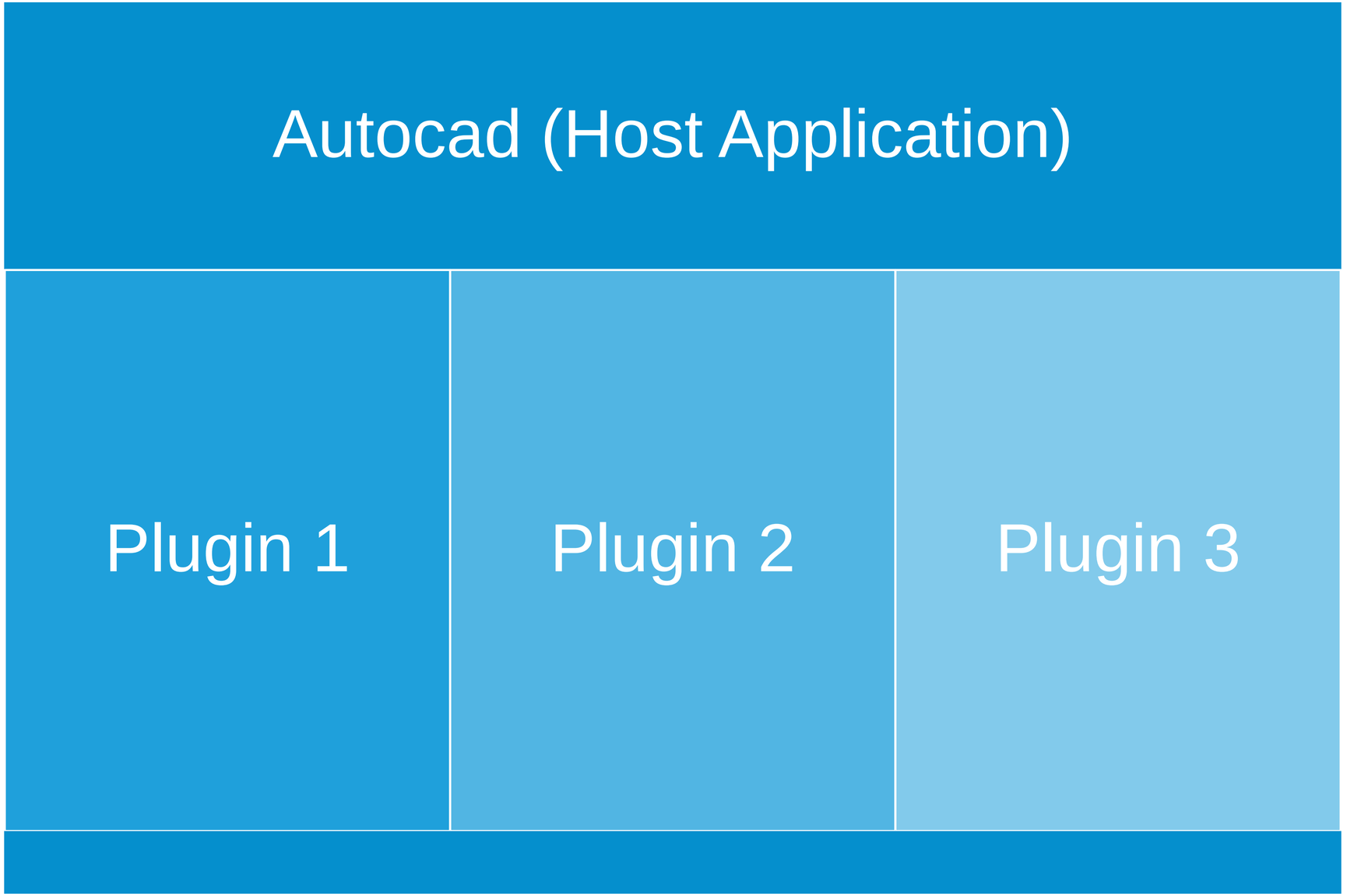
PARCEL SUMMARY

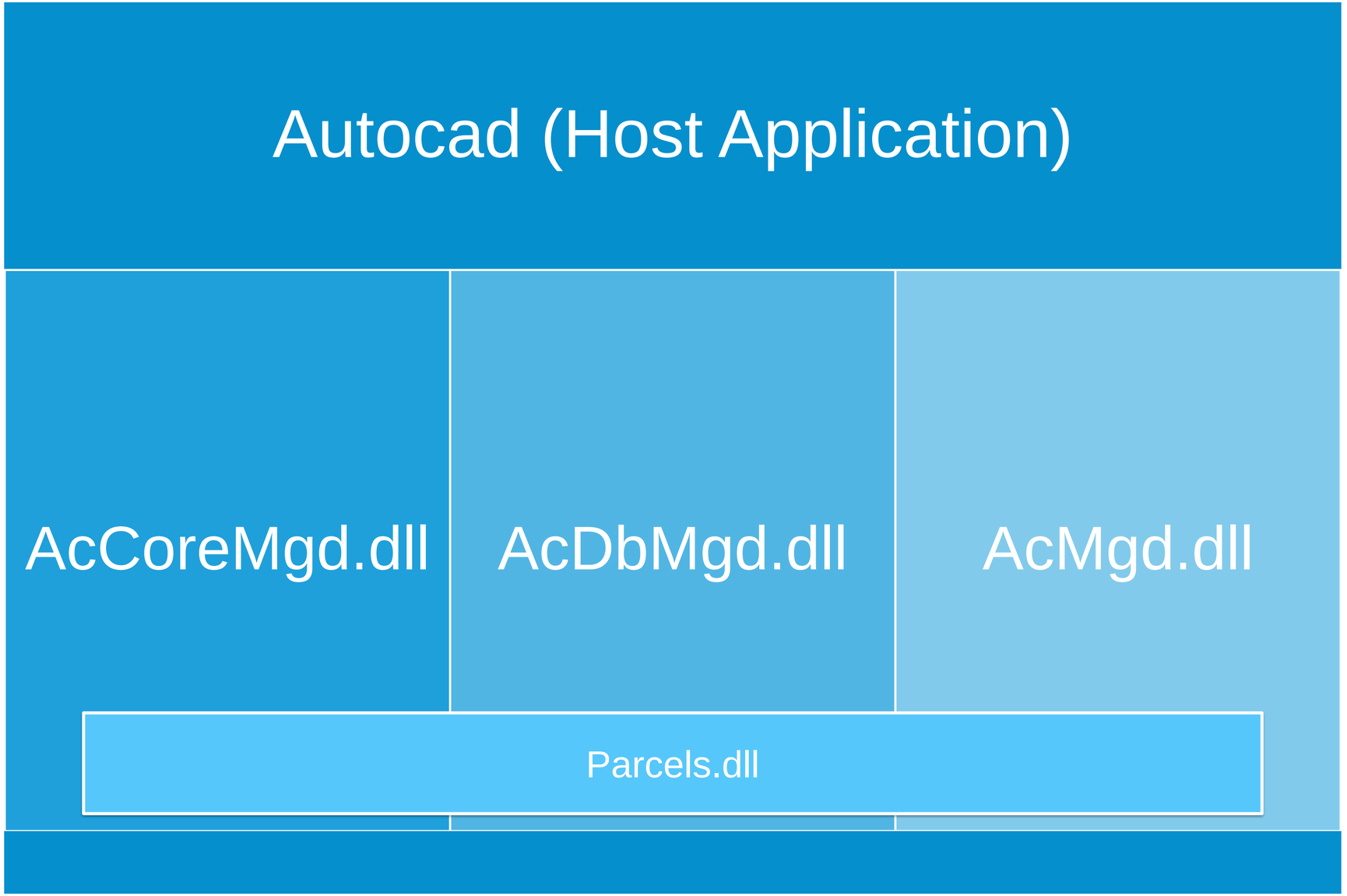
Interact with the Autocad Object Model to automate processes.

OBJECTIVE 4

PARCEL SUMMARY WRITER

Use abstraction to make code more flexible.

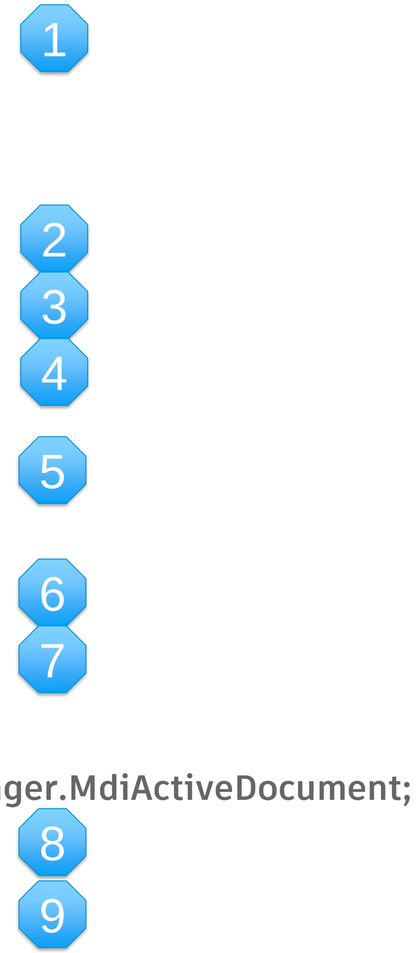

Autocad (Host Application)
Plugin 1
Plugin 2
Plugin 3


Autocad (Host Application)
AcCoreMgd.dll
AcDbMgd.dll
AcMgd.dll
Parcels.dll

Overview of C# Syntax

```
using Autodesk.AutoCAD.ApplicationServices;
using Autodesk.AutoCAD.Runtime;
using System;

namespace Parcels
{
    public class Commands
    {
        public Commands()
        { }
        [CommandMethod("PS_HELLO")]
        public void Hello()
        {
            var document = Application.DocumentManager.MdiActiveDocument;
            var editor = document.Editor;
            //write to command prompt
            editor.WriteMessage("\nHello World!");
        }
    }
}
```



1. declarations: “shortcuts” to access anything in the designated namespace

2. Namespace: organizes and separates code into “containers.” In C#, default namespace is name of the project (+ folder name).

3. Brackets: curly brackets designate start and end of code blocks: namespace, class, methods, as well as certain statements such as *if/else*, *for*, *foreach*, and *switch*.

4. Class: a blueprint for creating objects that carry data and/or functionality.

5. Constructor: a way to initialize an object to a certain state, usually by passing in objects or data to the parameters (if present).

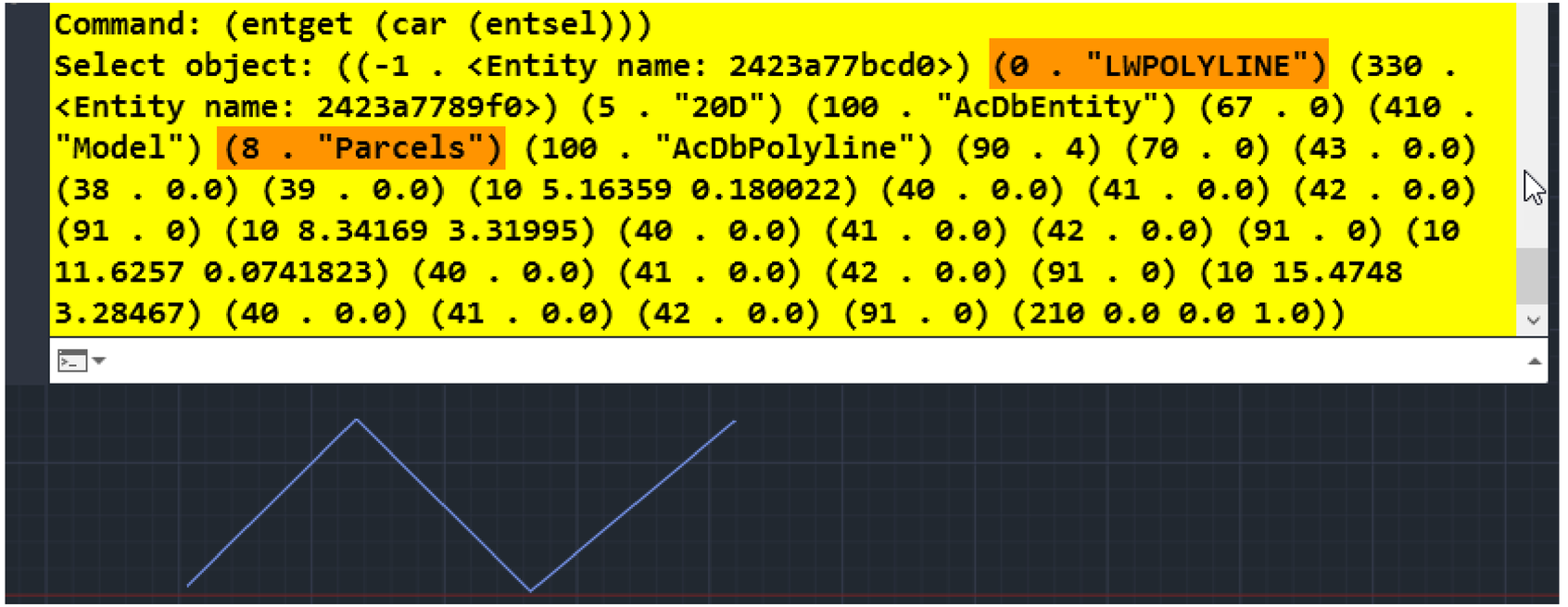
6. Attributes add “metadata” to classes and methods. Autocad uses CommandMethod to identify commands you can run from command prompt.

7. Method (void): method that does something but does not return a value. Methods can also return a value; *void* is replaced by the return type.

8. Statement: a line of code that performs some operation. Statements in C# are terminated by ;.

9. Comments: // are used to designate a comment.

Typed Values and DXF Codes



REQUEST #1

Output to command prompt?

REQUEST #2

Output to text file?

REQUEST #3

Output to Excel?

REQUEST #4…

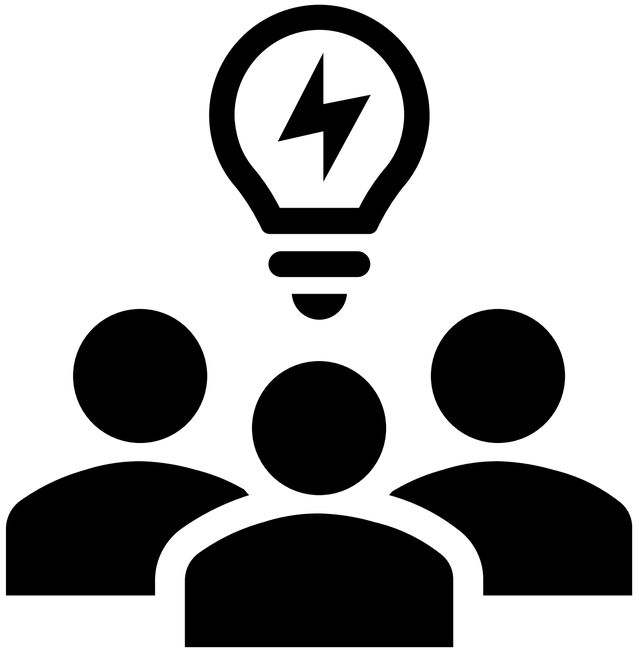
Output to Database or Html?

Interfaces

- **Define a “contract” for implementers**
- **Method signatures**
- **Properties**
- **No implementation (no executable code!)**

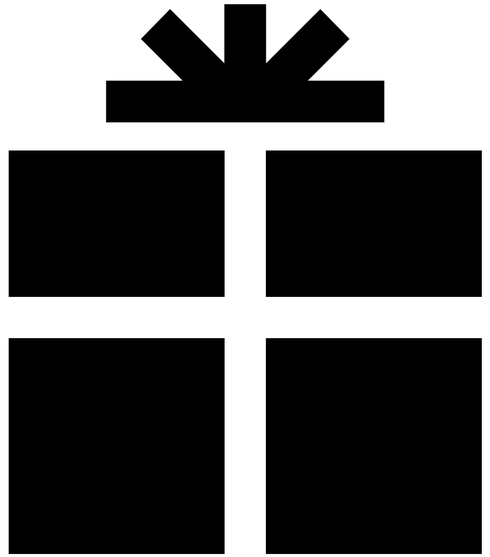
New Requirement!

- Filename
- **Parcel Summary**
- Date/Time stamp



Design Patterns

The Decorator Pattern helps us “decorate” old functionality with new functionality.



Resources

- **ben@leadensky.com**
- **https://www.autodesk.com/autodesk-university/**
  - https://www.autodesk.com/autodesk-university/class/Exploring-Entity-Framework-AutoCAD-Development-And-Beyond-2015
  - https://www.autodesk.com/autodesk-university/class/Control-Your-Code-Introduction-Source-Control-Programmers-and-CAD-Managers-2018
  - https://www.autodesk.com/autodesk-university/class/Clean-Code-Tips-Writing-Clear-and-Concise-Code-2018
  - https://www.autodesk.com/autodesk-university/class/Clean-Code-2-More-Tips-Writing-Clear-and-Concise-Code-2019
  - Scott McFarlane: https://www.autodesk.com/autodesk-university/class/Being-Remarkable-C-NET-AutoCAD-Developer-2015
- **https://www.autodesk.com/developer-network/overview**

Live Q&A

During week of AU 2020
Check class page for date, time and details

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