

Creating Popfly Mashups: A How-To Guide for Teachers, Students, and Popfly Enthusiasts

This is a series of nine lessons about creating real world Popfly Mashups. They are not tutorials. They won't tell you what to do without telling you why you're doing it. Each lesson illustrates a basic software development concept – such as structured data, logic, and iteration, or describes how to build a software application that relies on XML, RSS, or mapping data.

These are topics not often taught at the senior high school or introductory college level, because of the amount of programming knowledge that is required to interact with them. Microsoft Popfly removes that barrier and becomes a platform where teachers, students, and Popfly enthusiasts can create real web applications without writing any code.





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Introduction

This is a series of nine lessons about creating real world Popfly Mashups. They are not tutorials. They won't tell you what to do without telling you why you're doing it. These lessons present strategies for using Popfly's Mashup Creator to build effective mashups, and talk about the underlying software development or technology concepts that make the mashups work at an introductory level.

Each lesson illustrates a basic software development concept – such as structured data, logic, and iteration, or describes how to build software applications that rely on XML, RSS, or mapping data. These are topics not often taught at the senior high school or first year college level because of the amount of programming knowledge that is required.

Microsoft Popfly's Mashup Creator removes that barrier and becomes a platform where teachers, students, and Popfly enthusiasts can create real web applications without writing any code. In the process, students interact with real data and learn about software design and development concepts as they create their own Web 2.0 applications.

Teachers can use these lessons to enhance traditional introductory information technology or computer / media literacy courses, or perhaps as a prelude to teaching a programming course. Students and other Popfly enthusiasts who want to learn how to build real world mashups that contain more than a few blocks can follow the lessons to learn new techniques, and then and try some of the exercises that accompany each lesson.

Much of this material grew out of a series of exercises created for an experimental, “technology intensive” section of IT 101 (Introduction to Information Technology), at Bentley College, a leader in business education, located in Waltham, MA, during the fall of 2007. At the same time, Microsoft introduced a new web-based software application called Popfly. The intent of the course was to introduce simple programming concepts by building Popfly mashups. In reality, the students obtained a broad introduction to software application development, deployment, web services, RSS feeds, “cloud computing,” and more.

These lessons show what my students and I learned.

Professor Popfly’s Mashups

I have become known in some circles as Professor Popfly, because my class at Bentley was one of (if not) the first college course anywhere that used Popfly as a tool for teaching information technology concepts. That explains the reason for “Professor Popfly” as my login name for the lessons in this series.

Each of the nine lessons in this series begins with a list of links to “Professor Popfly’s mashups” referenced in the lesson. As you follow the lessons, you should refer to these mashups to see what blocks are connected, and how. Run them, rip them, tweak them, modify them, and save them as your own.

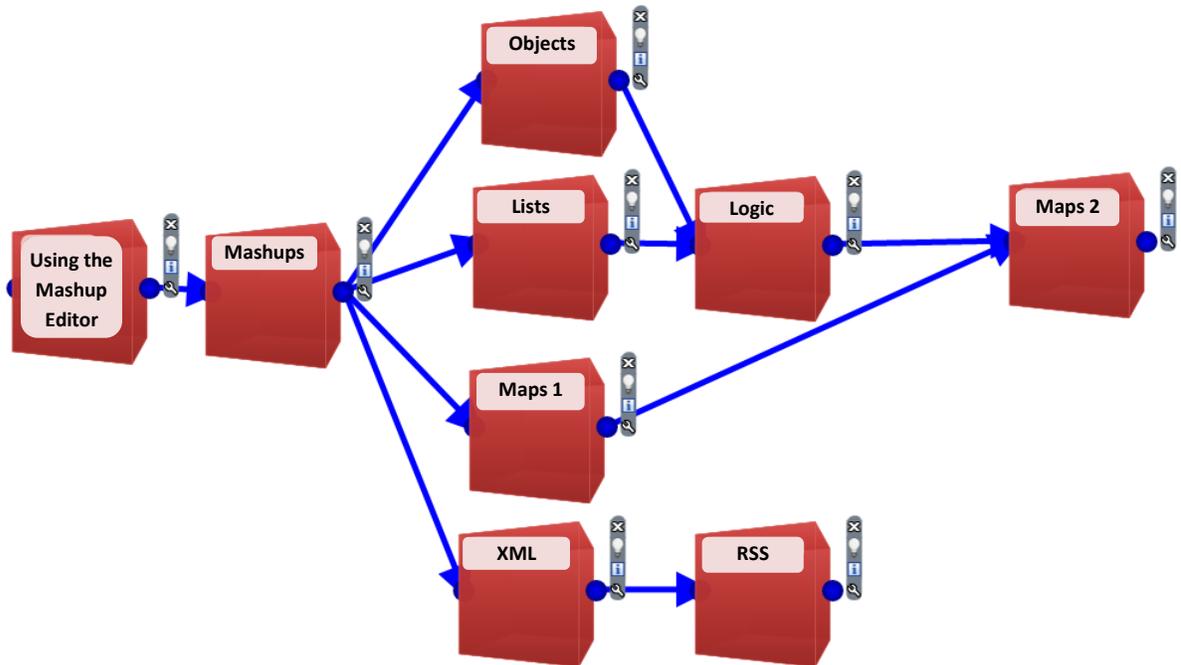
Popfly PopQuiz and Try it in Popfly Exercises

Each lesson also contains expected learning outcomes, and ends with a Popfly PopQuiz: several short questions to check understanding of some of the concepts presented. Each lesson also includes some exercises of varying difficulty to try in Popfly.

Easier exercises are labeled with one ; more challenging exercises are indicated by four s. A list of web sites with some relevant related materials follows many of the lessons.

The Lessons

There are nine lessons in this series. This diagram suggests an order in which you might complete them.



If you're new to Popfly's Mashup Creator, complete the two introductory lessons (Using the Mashup Editor and Mashups) first. The lessons on Objects, Lists, and Logic will introduce basic programming / software development concepts using Popfly. The lessons entitled Maps 1, XML, and RSS introduce technologies for building web applications. Finally, Maps 2 explores software design strategies when creating a "real world" mashup application.

Here are detailed descriptions of each lesson:

- **Using the Mashup Editor** – This lesson will get you familiar with the Popfly mashup editor, and creating, saving, and modifying mashups. While learning about data types, and Popfly blocks for obtaining, processing, and displaying data, you'll build a mashup to display information about movies playing at a theater near you.
- **Mashups** – This lesson introduces the concepts of mashups by showing how to build some simple real-world mashups. You'll build mashups to display spinning photos, and plot earthquakes on a map. The lesson describes how mashups "work," where the content comes from, and describes the role of application programming interfaces to get a sense of what Popfly is doing behind the scenes.
- **Objects** – This lesson presents basic object-oriented concepts such as classes, methods, parameters, instances, and properties within the context of creating Popfly mashups. In this lesson you will create mashups that interact with structured data, combine news sources, and display photographs

from different photo sharing web sites, within the same application.

- **Lists** – This lesson teaches about sequentially structured data, and the idea of iterating over a collection of objects stored that way. The lesson teaches how to build a weather map mashup that becomes completely customizable when the data it is accessing is stored in a list structure. Examples also show how to create and combine lists of information, and recognize the differences between static and dynamic data. As an aside, the lesson also describes how to use Popfly to concatenate (append) character string values.
- **Logic** – This lesson demonstrates the notions of both branching and filtering logic, creating an easy way to test and compare data within Popfly. To get the most out of this lesson, you should complete both the Objects and Lists lessons first.
- **XML** – This lesson describes the eXtensible Markup Language (XML) that is used for sharing information on the Web. You will learn about XML while interacting with Popfly blocks, RSS feeds, and web services. You will build a mashup web gadget that displays items from an RSS feed.
- **RSS** – This lesson feeds enable sharing of blog posts, podcasts, news headlines, and other content on the web. This lesson shows how to build mashups that combine, filter, and display values from RSS feeds.
- **Maps 1** – This lesson introduces mapping mashups, and presents four techniques for adding data to maps. You'll locate houses for sale, gas prices, and other geographical information to plot on Virtual Earth maps.
- **Maps 2** – This lesson shows how to create a store-finder mashup, treating the task as a small scale, real-world software development project. It introduces the notions of user and functional requirements, design concepts, and web application architecture.

Acknowledgments

Thanks to:

- Philip DesAutels, Microsoft Academic Evangelist. We were having breakfast one morning in May, 2007, and Philip said “Microsoft is working on a new mashup application.” If I get you an invitation code, maybe you can try it to use in your class.” Popfly was still in “alpha” mode at that time, and the only way to use it was by invitation only. Who knew that a few months later, I’d be knocking on the door, asking to invite sixty more people to the party.
- John Montgomery and Suzanne Hansen, from the Microsoft Popfly team, who followed our work with Popfly in the classroom from the beginning. Their interest in how we used Popfly as a tool for teaching Information Technology concepts enabled this work to happen.
- Doug Robertson, chair of the Computer Information Systems Department at Bentley College, who supported my decision to bring Popfly to Bentley’s Technology Intensive IT 101.
- My students. They tested many of these lessons and created some of the most creative mashups I’ve ever seen. They kept me on my toes about the relevance of what they were learning.

I’ll always remember the day I showed the real estate map mashup in class, and one student, Ryan, asked, “Lots of web sites already do that. Why do we need to know how?” “Simple,” I said. “Before those ideas could become marketable products, their originators needed two things: a business plan and a technical proof of concept. It doesn’t matter how good the business plan is if they can’t show that their idea is technically possible.” Teaching Popfly gives students an awareness of what is possible, and the skills to construct simple mashups to validate the feasibility of their own ideas.