[Course Overview](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live" \t "psplayer)

[Course Overview](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live)

[Hi everyone, my name is Harrison Ferrone,](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=5.95) [and I'd like to welcome you to the C#](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=8.32) [Designed Patterns: Prototype course. I'm a](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=10.36) [software developer and instructional](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=13.1) [author at my own little corner of the](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=14.84) [world, paradigm shift development. Most](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=16.52) [days you can find me creating unity](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=19.46) [content, doing a bit of freelance iOS](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=21.12) [development, or editing technical content](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=23.54) [for the Ray Wenderlich website. Now](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=26.11) [software development is full of pesky](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=28.14) [recurring problems that you'll run into](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=30.23) [again and again throughout your career.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=32.67) [Not to worry. Design patterns were](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=34.84) [canonized for just such occasions when you](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=36.77) [need some best practices to guide the way](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=39.5) [forward. This course is a jumping off](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=42.15) [point into the prototype design pattern in](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=44.09) [C#, so you don't need any prior experience](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=46.32) [with them to get the ball rolling. Some of](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=48.95) [the major topics that we'll cover include](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=51.18) [defining a food order object class, adding](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=53.59) [a copy and clone interface, creating a](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=57.56) [concrete cloning class, differentiating](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=60.99) [between deep and shallow copy, and use](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=64.43) [cases and practical applications. By the](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=68.13) [end of this course, you'll be comfortable](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=71.11) [with identifying and analyzing practical](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=72.86) [use cases for the prototype pattern and be](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=75.73) [ready to bring that code and the skills](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=78.39) [you've learned into your own C# projects.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=80.27) [Since this is an intermediate course, you](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=83.41) [should be familiar with the C# programming](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=85.27) [language and know your way around Visual](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=87.43) [Studio on either Mac or Windows. The](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=89.7) [beginner level C# Fundamentals course in](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=92.21) [our library can quickly get you up to](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=94.5) [speed if you're just starting out or if](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=96.44) [you need a refresher. I hope you'll join](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=98.75) [me on this journey into software design](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=100.81) [with the C# Design Patterns: Prototype course, at Pluralsight.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=f9e116ac-e078-4876-bef4-f72dd6fb9826&clip=0&mode=live&start=102.81)

[Implementing the Prototype Pattern](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live)

[The Prototype Pattern Explained](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live)

[All right folks, welcome to the course.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=1.02) [Over the next few clips, we're going to be](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=4.02) [discussing the prototype design pattern](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=5.89) [and its implementation, along with its use](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=8.37) [cases and application in real‑world](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=11.47) [development. This is going to include](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=13.59) [setting up a simple object class, creating](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=17.11) [an abstract prototype class, handling](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=20.17) [shallow and deep copying, using a](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=23.21) [prototype manager, and reviewing common](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=26.47) [use cases and applications of the pattern](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=28.95) [itself. As you might already know,](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=31.03) [designed patterns are classified into](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=33.76) [three different categories, Creational,](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=35.62) [Structural, and Behavioral, outlined by](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=38.42) [the Gang of Four's text on elements of](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=41.3) [reusable object‑oriented software. The](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=44.35) [prototype pattern falls into the](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=46.96) [Creational category. More specifically, it](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=48.91) [specifies the kinds of objects to create](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=51.79) [using a prototypical instance and creates](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=55.26) [new objects by copying this prototype.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=58.25) [From a high level, this pattern allows a](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=62.14) [client to request a clone of an existing](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=64.48) [object from the object itself. On a](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=67.37) [smaller scale, using this pattern can cut](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=70.44) [down on your subclassing hierarchy by](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=72.75) [allowing you to create configurable clones](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=75.22) [of existing classes instead. We will talk](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=77.78) [more about specific use case criteria at](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=81.17) [the end of the course, but before we jump](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=84.03) [into any code, let's look at a UML diagram](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=86.34) [of the prototype pattern to get our heads](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=89.07) [around it in a more visual sense. Now this](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=91.46) [one is fairly simple. We have a prototype](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=94.57) [interface, which in our case is an](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=96.99) [abstract class, that has the blueprint](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=99.08) [Clone method for all our adopting classes.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=101.55) [Then we have as many concrete](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=104.73) [prototypeable classes as we need, each one](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=106.31) [responsible for cloning and returning a](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=109.33) [copy of itself on command. Finally, we](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=111.69) [have a client, which makes the actual](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=114.38) [cloning request from an existing object](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=116.28) [that implements our prototype interface.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=118.99) [In summary, you'll want to implement the](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=121.69) [prototype pattern when object creation,](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=123.74) [composition, and representation needs to](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=126.6) [be separate from a given system. And with](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=129.79) [that bit of theory, under our belts, we](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=132.18) [can safely move on to creating our example class and making it cloneable.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=0&mode=live&start=134.04)

[Creating an Order Class](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live)

[Before we can do any object cloning, we](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=1.14) [need a prototype class object. The example](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=3.63) [scenario we're going to use for this](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=6.5) [course is that of a food ordering](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=8.08) [application where a handy feature would be](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=9.98) [the copying of favorited food orders](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=12.36) [customers may have already saved. The](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=14.42) [first thing we need to do is open up](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=16.71) [Visual Studio, and we're going to start](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=18.41) [ourselves a new console application. Make](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=20.39) [sure that C# is the language selected, now](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=23.85) [hit Next, and I'm going to name this](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=27.375) [Prototype Pattern and hit Create. Once](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=30.55) [that's all loaded up, let's go up to the](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=35.32) [Project menu and add a class. Make sure](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=37.31) [that C# is selected, and for the Name, I'm](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=41.7) [going to call this FoodOrder.cs and hit](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=45.9) [Add. Before we do anything, we do want our](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=49.29) [food order to be public, so let's add the](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=52.33) [keyword right onto the front of our class.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=55.41) [Now our food orders are going to be pretty](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=58.44) [simple, but they do need a few properties.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=59.86) [So let's start out by adding a public](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=62.6) [string customerName, a public Boolean](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=64.97) [called isDelivery, and a public string](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=72.03) [array that's going to handle our](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=76.11) [orderContents. I've made these all public](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=78.77) [here to keep things simple, but there's no](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=81.71) [rule saying you can't have private](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=83.49) [variables with public backing properties](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=85.19) [in this design pattern. That being said,](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=87.77) [let's also declare a class constructor](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=89.95) [that's going to set up all these values.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=92.48) [We'll say public FoodOrder, and it's going](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=96.49) [to take in a string name, a bool delivery,](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=99.845) [and a string array contents. Perfect. Now](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=105.24) [we're just going to say this.customerName](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=111.69) [= name, this.isDelivery = delivery, and](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=115.85) [this.orderContents = contents. Go ahead](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=120.33) [and save that off. Now this should look](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=124.62) [pretty ordinary. And all we're really](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=127.35) [going to do to round out this clip is to](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=129.5) [add a debug method to help us visualize](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=131.3) [what's going on with our food orders once](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=134.08) [we start cloning them. So underneath our](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=136.36) [class constructor we'll say public void](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=138.97) [Debug, no parameters, and this is just](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=142.61) [going to have a bunch of](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=146.49) [Console.WriteLines. After the little](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=147.4) [header, I'm going to print out the name](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=156.55) [and delivery name. And Delivery, and we'll](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=158.25) [just put those values in this.customerName](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=168.73) [and this.isDelivery. Now for the order](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=174.34) [contents, we'll do one last](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=179.03) [Console.WriteLine, and in here we'll say](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=182.08) [Order Contents, and we'll just use the](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=186.43749999999997) [string.Join method because it's the](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=189.83499999999998) [easiest way to print this out in one line.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=192.37) [We'll have each item separated by a comma,](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=195.44) [printed out in our orderContents array.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=198.59) [Perfect. Now that that's set up, we do](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=206.51) [need to make sure that everything is](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=209.44) [working as expected. So let's go into our](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=210.83) [Program.cs, delete our Hello World, and](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=213.51) [let's create a new food order item. I'm](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=217.99) [going to have a header here that just](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=222.06) [makes sure that we know that this will be](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=224.64) [the original order item. And we'll create](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=227.45) [a new FoodOrder, we'll call this](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=230.26) [savedOrder, and we'll use our class](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=232.96) [constructor. I'm going to put it in as](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=237.39) [myself, it is for delivery, and I'll just](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=240.08) [create a new string array in line here,](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=246.15) [and I'll say I want a Pizza and a Coke.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=249.73) [Awesome. Now we're just going to go ahead](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=255.72) [and debug this out, so we'll say](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=258.75) [savedOrder.Debug and save. If we run this](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=261.09) [now, we should see that the debug output](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=268.8) [with our order info, which is correct](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=270.89) [here. We've got an original order with my](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=273.61) [name, delivery Boolean, and order contents](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=275.92) [all printed out correctly. So that's](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=279.12) [working perfectly. With the Order class](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=281.3) [set up, we're now ready to implement the](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=284.03) [actual prototype cloning behavior, which we'll do in the next clip.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=1&mode=live&start=286.03)

[Implementing Object Copying](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live)

[All right, now that we've got the order](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=1) [objects set up, we can define an abstract](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=2.95) [prototype class that all of our cloneable](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=5.78) [objects are going to have to inherit from.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=8.18) [I'm going to go up to the top of our](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=10.31) [namespace. I'm going to add in a public](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=11.51) [abstract class and we'll call it](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=15.24) [Prototype. This class is going to](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=18.57) [eventually have three methods. A shallow](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=20.93) [copy, a deep copy and debug. We've already](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=23.11) [implemented the debug in our food order](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=26.5) [class, but I like keeping it in the](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=28.44) [abstract class so that all prototypeable](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=30.51) [objects have to include it. For now, we'll](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=33.05) [leave out the deep copy until later in the](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=35.61) [clip, Let's add are shallow copy here,](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=38.02) [we'll say public abstract. We want this to](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=41.75) [return a Prototype object, and it won't](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=44.61) [take any arguments. We'll also declare our](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=48.21) [public abstract void Debug, and we'll have](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=52.35) [our FoodOrder inherit from Prototype. This](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=55.88) [makes everything nice and dramatically](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=60.04) [sensible. And anyone else on your team is](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=61.76) [going to thank you for that. Visual Studio](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=64.31) [is yelling at us because FoodOrder does](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=66.67) [not actually implement our prototype](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=68.62) [methods yet. So let's fix that. Let's add](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=70.76) [the override key word to Debug, and](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=73.41) [underneath the class constructor we'll add](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=76.93) [in our ShallowCopy. We're still going to](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=79.34) [get an error because we haven't actually](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=86.61) [returned a prototype object. So I'm going](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=88.25) [to do that here and then we'll explain](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=90.715) [what's going on. I'm going to explicitly](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=92.73) [cast whatever we're returning as a](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=95.38) [prototype object. And then we're going to](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=97.38) [use a new method that you might not have](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=99.27) [seen before called MemberwiseClone. Now](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=100.79) [what MemberwiseClone does is returns a](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=103.69) [shallow copy of the current object. A](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=105.98) [shallow copy means that all non‑static](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=108.42) [value types in the object are copied over](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=110.94) [to the clone. But reference types only](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=113.62) [have their addresses copied. That means](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=116.16) [that any change to the original object](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=118.56) [will also affect the clone, which could be](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=120.75) [really troublesome in most cases and is](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=123.05) [not the behavior you typically want.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=125.18) [Before we illustrate the drawbacks of](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=127.6) [shallow copying, though, let's actually](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=129.57) [use the method to make sure that](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=131.89) [everything is working properly. Let's go](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=133.53) [into our program and underneath where we](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=136.15) [did our original order, going to add in a](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=138.64) [new Console.WriteLine to remind myself](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=141.67) [that this is going to be the Cloned order.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=144.44) [And we'll just create a new FoodOrder,](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=148.48) [call it clonedOrder. Make sure to](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=151.52) [explicitly cast whatever we're getting](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=154.85) [back from our shallow copy and we'll just](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=156.98) [say savedOrder.shallowCopy. Now, let's](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=160.01) [debug this out, save, and run. Now we can](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=165.74) [see here that both of our food orders are](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=171.44) [exactly the same, as we don't have any](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=173.62) [embedded reference types. A note here,](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=175.8) [strings are technically referenced types](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=178.13) [in the C# language. But in this instance,](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=180.32) [they transfer over when shallow copied. To](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=182.61) [see the drawbacks of shallow copying in](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=186.2) [action, let's go back to our food order,](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=189.09) [and we're going to create a class that's](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=190.85) [going to hold an order ID number. And then](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=193.7) [we're going to add a type of that class to](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=196.08) [our food order itself. So underneath](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=199.17) [Prototype, I'm just going to say public](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=203.25) [class, I'm going to call this OrderInfo.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=205.06) [It's going to have one field. It's a](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=209.44) [integer, we'll call it id, and we'll give](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=211.91500000000002) [it a constructor to set that ID. Let's go](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=215.36) [down to our food order underneath](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=223.87) [orderContents and we'll say public](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=225.37) [OrderInfo, and I'm going to call this](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=228.38) [info, and we need to change our](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=230.58) [constructor. So we'll do that real quick,](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=233.35) [and save it off. Perfect. Now let's go](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=237.45) [down to the debug and we'll add one more](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=243.56) [Console.WriteLine so that our new property](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=246.42) [is printed out. We'll say ID and we'll use](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=248.6) [this.info.id. Wonderful. Now, while we're](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=253.1) [here, let's test this out by changing the](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=257.68) [name and order number of our originally](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=260.12) [saved order inside our main program.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=262.69) [Actually, before that, we do need to](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=266.25) [update our constructor for our original](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=267.71) [order. So we'll do that real quick, after](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=269.93) [our contents, we'll add a new OrderInfo](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=273.27) [object with the ID 2345. Why not?](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=276.55) [Underneath our cloned order let's add](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=282.57) [another WriteLine to remind ourselves that](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=284.53) [what's printed out after this is the Order](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=288.85) [changes. And we'll say](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=291.28) [savedOrder.customerName and we'll change](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=293.04) [this to Jeff, savedOrder.info.id. We'll](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=296.72) [change it to all fives and we'll print](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=302.67) [both of these out again. Make sure to save](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=305.81) [and let's give this a run and see what](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=311.59) [we've got in our console. All right, so,](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=313.16) [looking at the output, it's going to show](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=316.45) [us that the name change in our original](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=318.3) [order didn't affect the clone, which is](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=320.54) [great. However, the change to the original](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=322.47) [order ID affected the clone, and now it's](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=325.16) [5555, as with the original. Now to get](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=328.2) [around this, we're going to implement](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=331.28) [what's called deep copying, and that's](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=332.78) [going to account for the reference types](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=334.8) [being separate in an original and cloned](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=337.15) [object. And this could be done in a few](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=339.46) [ways. But the easiest is to simply add a](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=341.89) [deep copy method to our prototype class](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=344.47) [and manually configure our reference type](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=347.04) [after creating a shallow clone. Let's go](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=349.35) [back into our food order. We'll go up to](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=351.49) [our prototype class. We're going to add in](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=354.35) [a new method. This is going to also return](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=357.02) [prototype object, and it's going to be](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=360.46) [called DeepCopy. We're going to go down to](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=363.06) [our food order, below ShallowCopy, let's](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=367.38) [implement this. Say public override](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=370.65) [Prototype DeepCopy. And let's actually](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=375.63) [just make the shallow clone first. So,](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=380.72) [we'll say FoodOrder clonedOrder we'll](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=384.04499999999996) [explicitly cast it, and we'll use](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=389.43) [MemberwiseClone once again. After](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=392.19) [wondering why I just didn't call are](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=395.06) [shallow copy method, it's because in most](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=396.78) [cases you won't have both of these in your](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=399.17) [program. You'll want to choose which one](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=402.52) [suits your needs. So I'm going to keep](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=404.31) [them completely separate. Once we've got a](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=405.93) [new shallow copy, we can account for the](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=408.51) [reference. We can just set our info to a](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=410.58) [brand new instance of OrderInfo. And we](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=414.53) [can initialize it to get the actual copy](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=417.15) [of the object we're working with by saying](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=419.35) [this.info.id and return the cloned order.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=421.45) [If we go back to our program, we're going](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=428.8) [to change our shallow copy method call to](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=431.12) [DeepCopy, save it off, and run. Now we can](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=433.77) [see in our Order changes section that our](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=438.51) [original object has been changed with the](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=440.96) [name and ID, but our cloned object is](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=444.08) [exactly the same as the first instance](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=446.31) [before the changes took effect. With that](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=449.13) [done, we've successfully implemented a](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=451.57) [basic prototype pattern. All that's left](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=453.34) [is to touch on a popular variant using a](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=455.79) [prototype manager class, which we'll do in the next clip](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=2&mode=live&start=458.47)

[Adding a Prototype Manager](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live)

[[Autogenerated] before we round out the](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=0.9) [course, we're gonna talk about an](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=1.91) [important variant that you'll see quite](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=3.48) [often in the prototype pattern. And that's](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=5.38) [using a manager class. Essentially, all](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=7.49) [this does is keep track of a dictionary of](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=10.4) [prototype objects by key value pair,](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=12.52) [making it easier for client code to](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=15.12) [reference them and takes out the need for](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=16.91) [the objects to be created on the fly.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=18.96) [Let's go back into our food order, and I'm](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=21.61) [gonna lay this out at the bottom of our](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=24.26) [name space, make myself some room, declare](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=25.96) [a new public class called prototype](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=30.36) [manager. We'll need a private dictionary](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=34.23) [here to hold our prototypes, So let's](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=37.74) [declare it as private Dictionary of String](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=40.4) [prototype. So we have key value pairs.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=45.04) [Name this underscore prototype library,](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=48.23) [and I am gonna just initialize it so we](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=52.18) [don't have any errors. Now you can](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=55.23) [absolutely declare a class constructor](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=57.86) [here and initialized the prototype manager](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=60.04) [with the objects you want to store.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=62.37) [However, that is overkill for this](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=64.43) [example, so I'm just gonna add an index or](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=66.02) [to the class and add the prototype objects](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=68.47) [manually when we need to. So it's a public](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=70.98) [prototype. This and We'll specify that](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=74.55) [strings are the keys and will say get. And](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=78.64) [every time we try and get this, we're](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=83.18) [gonna return. Prototype Library Forgiven](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=84.59) [Key. Now, when we try to set this well say](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=90.59) [prototype library done and and we'll use](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=95.32) [the key supplied and whatever value](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=101.45) [perfect. That's pretty much all we need](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=104.65) [for the basics of the manager class. Let's](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=106.75) [go back to our program. And underneath all](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=108.96) [are shallow and deep copying logic. Let's](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=112.76) [create a new prototype manager. I'm gonna](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=115.61) [create an order and I'm gonna add it or](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=121.79) [index it by a date string and we'll just](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=124.91) [say 23 2020. And this is gonna be a new](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=128.28) [food order and we'll say, This is gonna be](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=133.3) [for Steve. He's gonna pick it up. Sora is](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=136.56) [delivery is false for his order contents.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=142.46) [Let's see what a Steve want. He wants a](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=148.57) [chicken parm and a root beer. And for the](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=150.88) [order, I d. Will say New order info. 8912](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=157.48) [Let's add a consul right line here that we](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=164.8) [know that we're grabbing this and this is](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=168.4) [our manager clone. We'll create a new food](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=170.51) [order. We'll call it Manager order](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=173.47) [explicitly cast it and then grab the order](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=179.24) [we want by key and called Deep Copy. It's](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=183.17) [also debug our manager order. Save it off,](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=191.81) [and I'm actually gonna comment out some of](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=196.74) [our previous code just so we can see the](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=199.8) [output a little clear. It's getting a bit](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=202.12) [cluttered. As we can see, the output is as](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=204.72) [we expect. We have a deep clone of our](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=212.73) [Steve order, and I'd say that this](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=214.93) [approach is actually going to scale fairly](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=217.94) [well with a large amount of prototype](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=220.11) [objects, especially if you passed in the](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=222.32) [orders to the pro tape manager on](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=224.59) [Initialization. While not included in the](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=226.87) [original Gang of Four text, the object](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=229.98) [pool pattern works extremely well with](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=232.82) [prototype, especially if it has a manager](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=235.22) [class. Just some food for thought as you](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=237.91) [continue your journey with design](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=239.98) [patterns. An important side note here.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=242.04) [We've only been using a single prototype](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=244.34) [object in this example, but it doesn't](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=246.7) [have to be that way. The whole point of](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=248.73) [having the abstract prototype class is](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=250.65) [that it can be implied to an indefinite](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=252.96) [number of objects that move may want to](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=255.23) [copy. Everything we've done will work just](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=257.42) [fine with a variety of different prototype](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=259.97) [objects, as long as they all inherit from](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=262.1) [the protect class and implement their own clothing and debug methods.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=3&mode=live&start=264.25)

[Use Cases and Implications](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live)

[Before we end the course, let's take a](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=0.93) [more in depth look at the real world](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=3.13) [scenarios and implications of the](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=5.26) [prototype pattern itself. First off, like](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=7.32) [all design patterns, implementing every](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=10.23) [object in your project as a prototype is](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=12.74) [not the way to go and can even be](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=15.41) [overkill. The key is to seek out the](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=17.35) [places where it really makes sense to use](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=19.99) [it and use it correctly. Common scenarios](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=21.94) [are going to include when classes to](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=25.19) [instantiate our specified runtime,](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=27.630000000000003) [avoiding a class hierarchy of factories](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=30.26) [that mirrors the class hierarchy of your](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=32.76) [products. And when class instances can](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=34.44) [only have a small, finite combination of](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=36.8) [state. If you are familiar with other](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=39.53) [creational patterns, specifically builder](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=42.18) [and abstract factory, you've probably](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=44.6) [noticed that they share several](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=46.67) [implications with prototype. First](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=48.46) [concrete prototype classes are hidden from](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=51.61) [the client. Second, as we've already](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=54.12) [noted, products can be added or removed a](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=56.33) [run time by the client. Thirdly, using](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=58.76) [cloned objects with varying configurations](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=61.25) [means your system is going to be more](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=64.32) [dynamic through this kind of object](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=65.81) [composition, and your class hierarchy is](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=67.58) [going to be cleaner and more efficient.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=69.85) [Lastly, prototype objects can be used as](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=72.24) [parts in a larger object creation design,](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=74.9) [which can also increase the modularity of](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=77.45) [your code. In summary, we've learned how](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=79.98) [to create an abstract prototype class that](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=83) [enforces a cloning blueprint on adopting](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=85.54) [classes. How to distinguish an implement,](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=88.13) [shallow and deep cloning. How to set up a](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=90.62) [prototype manager for storing and](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=93.41) [retrieving prototype objects more](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=95.5) [efficiently. And finally, how to identify](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=97.36) [and work with the prototype pattern in](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=100.04) [real world scenarios. If you've enjoyed](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=102.16) [the course, please leave a rating. And if](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=104.82) [you have any questions or just want to](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=107.05) [connect, feel free to drop me a line. As always, happy coding.](https://app.pluralsight.com/player?course=c-sharp-design-patterns-prototype&author=harrison-ferrone&name=907b308f-37ae-48d2-bd33-01992eab0ab8&clip=4&mode=live&start=108.59)