Module 20: "State"





Agenda

- ▶ Introductory Example: Setting a Timer
- Challenges
- Implementing the State Pattern
- Pattern: State
- Overview of State Pattern





Introductory Example: Setting a Timer

```
switch (_state)
case StateKind.Normal:
     return (ConsoleColor.Gray, DateTime.Now.ToShortTimeString());
 case StateKind.SetHours:
     return (ConsoleColor.Red, $"{_timerHours,2}");
 case StateKind.SetMinutes:
     return (ConsoleColor.Red, $"{_timerHours,2}:{_timerMinutes,2}");
 case StateKind.Completed:
     return (ConsoleColor.Green, timerSet?.ToShortTimeString());
default:
     throw new NotImplementedException($"State {_state} not expected");
```





Timer Setup Display

```
Timer 21:24 << >> OK
```

Timer 21 << >> OK

Timer 23:00 << >> OK

Timer 23:57 << >> OK

Timer 21:24 << >> OK





Challenges

- Extensibility problem when adding more states
- Highly repetitive code
- Multiple responsibilities mixed
- Almost impossible to unit test





Pattern: State

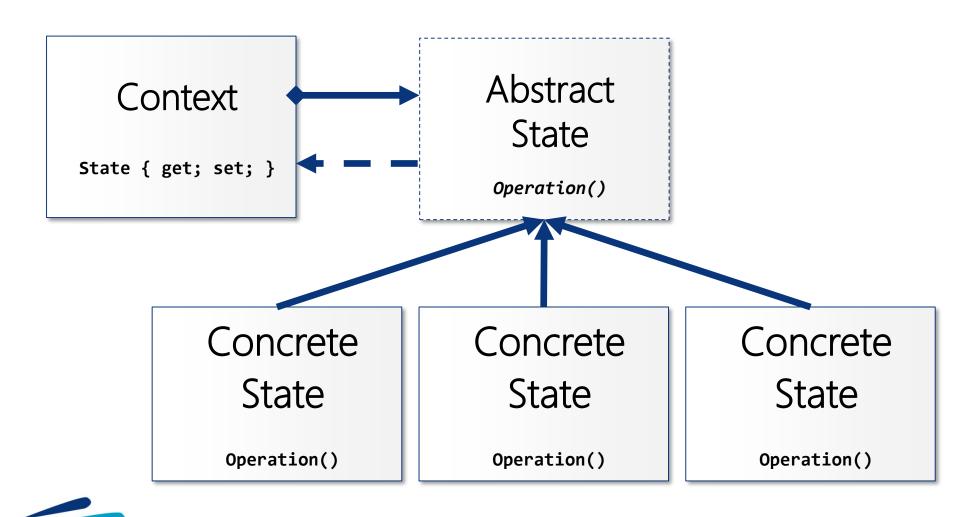
Allow an object to alter its behavior when its internal state changes. The object will appear to change its class.

- Outline
 - Encapsulate logic of distinct states into separate classes
 - Owner class will act a as proxy to state objects
 - Make program maintainable (and testable!)

Origin: Gang of Four



Overview of State Pattern





Overview of State Pattern

Context

- Main class accepting requests
- Has no state-specific behavior
- Refers to the Abstract State interface (or abstract base class)

Abstract State

- Interface or abstract class defining state behavior interface
- Might contain common state functionality or helpers, including State property or method

Concrete States

 Each concrete state class contains state-specific behavior relating to the particular individual state





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