

# 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

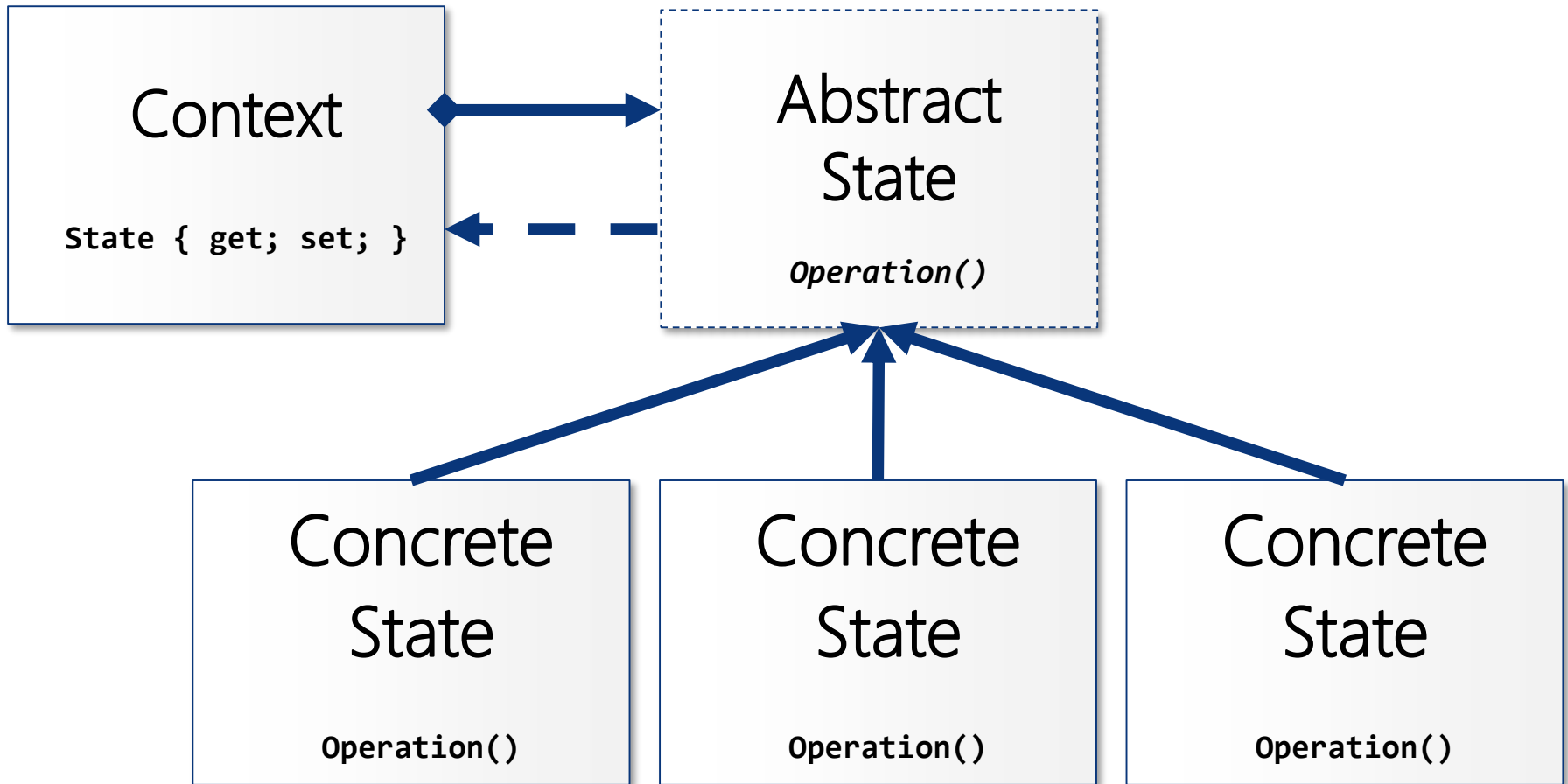


# Pattern: State

- ▶ *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 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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