# Module 18: "Memento"





## Agenda

- ▶ Introductory Example: Editing and Undoing
- Challenges
- Implementing the Memento Pattern
- Pattern: Memento
- Overview of Memento Pattern
- Reusability vs. Encapsulation





## Introductory Example: Editing and Undoing

Editing and Undoing	_	×
Name:		
Peter Parker		
Company:		
Web		
Add Undo		
Ash Williams		
S-Mart		

```
class Guest
{
    public string Name { get; set; }
    public string Company { get; set; }
}
```





## Challenges

- How do we implement undo?
- How do we externally save the internal state?
- Is it possible to do so without breaking the encapsulation of the object, i.e. exposing internal state?
- And how do we ensure only the object can access the state when externalized...?





#### Pattern: Memento

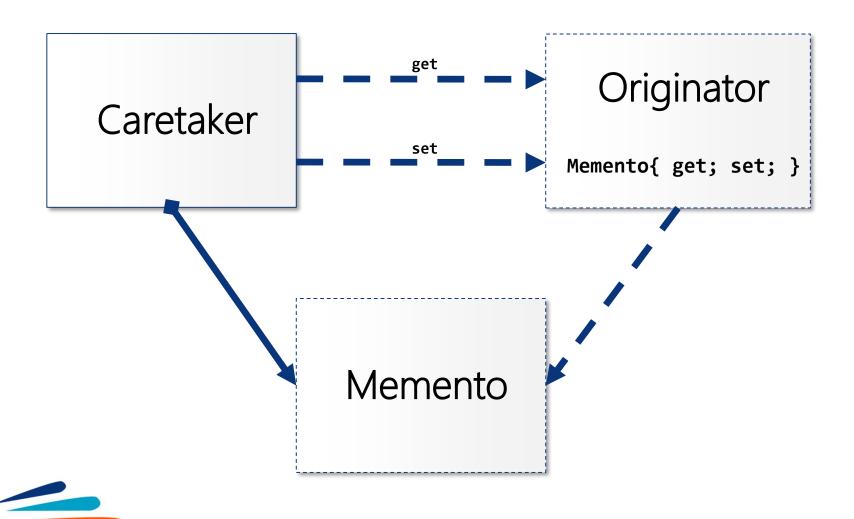
 Without violating encapsulation, capture and externalize an object's internal state so that it can be restored to this state later.

- Outline
  - Make object itself responsible for saving its internal state to a memento object.
  - Make object itself responsible for restoring its internal state from a memento object.
- Origin: Gang of Four





#### Overview of Memento Pattern





#### Overview of Memento Pattern

#### Caretaker

- Concrete class controlling the create/restore of Originator state
- Retrieves and sets Memento on Originator

#### Originator

- Concrete class containing state to be externalized
- Implements a property exposing Memento object

#### Memento

 Interface (or occasionally concrete class) containing externalized version of Originator state





### Reusability vs. Encapsulation

- It is not hard to create a reusable setup for Memento
  - IMemento<T>
  - Originator<T>
  - •
- But this allows everyone to "see" externalized state
- Consider creating an "anonymous" interface implemented by class internal to Originator

```
public interface IMemento
{
   object State { get; }
}
```







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