Factory Pattern

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Factory patterns

• Simple factory/Static factory method

• Factory method

• Abstract method
Context

A GUI application to deal with different widgets, such as button, text...
Widgets

class BUTTON
inherit WIDGET
...
end

class TEXT
inherit
inherit WIDGET
...
end
Simple factory

class
  WIDGET_FACTORY

feature
  new_button: BUTTON is
    -- New created button
    do
      create Result
    end

  new_text: TEXT is
    -- New created text field
    do
      create Result
    end

end
What if we want to support different OSs?

class UNIX_TEXT
  inherit TEXT
end

class WIN_TEXT
  inherit TEXT
end
We need to change our factory class

class
  MULTI_OS_FACTORY
feature
  new_button: BUTTON is
    do
      if platform.is_windows then
        create {WIN_BUTTON} Result
      elseif platform.is_unix then
        create {UNIX_BUTTON} Result
      end
    end
  new_text: TEXT is do ... end

  platform: PLATFORM
end
Abstract factory

defered class
    ABSTRACT_FACTORY

feature

    new_button: BUTTON is
        -- New created button
defered
    end

    new_text: TEXT is
        -- New created text field
defered
    end

end
Concrete factory for UNIX

class
    UNIX_FACTORY

inherit
    ABSTRACT_FACTORY

feature
    new_button: BUTTON is
        -- New created button
        do
            create {UNIX_BUTTON} Result
        end

    new_text: TEXT is
        -- New created text field
        do
            create {UNIX_TEXT} Result
        end
end
Concrete factory for Windows

class
  WIN_FACTORY
inherit
  ABSTRACT_FACTORY

feature
  new_button: BUTTON is
    -- New created button
    do
      create {WIN_BUTTON} Result
    end

  new_text: TEXT is
    -- New created text field
    do
      create {WIN_TEXT} Result
    end
end
Class diagram

```
* ABSTRACT_FACTORY

WIN_FACTORY
+ UNIX_FACTORY

new_button: ...

BUTTON

WIN_BUTTON
UNIX_BUTTON
```
Abstract factory

defered class
    ABSTRACT_FACTORY

feature

    new_button: BUTTON is
        -- New created button
        deferred
        end

    new_text: TEXT is
        -- New created text field
        deferred
        end

end