

Creational

[Factory method](#) - like abstract factory, but one method.

[Abstract factory](#) - many concrete factories providing common interface - like createButton for win, mac. Many methods coupled together for creating objects that are related.

[Builder](#) - object allowing sequential setting creation parameters and creating object at once

[Lazy initialization](#) - do not perform initialization until the object is used - flag + mutex in mt

[Multiton](#) - like singleton, but a map of named objects

[Object pool](#) - pool of objects, after usage returned to the pool, requests may be blocking or may fail

[Prototype](#) - create objects based on the pre-created prototype, avoid subclasses in favor of parameters set at runtime

[Resource acquisition is initialization](#) - tying resources to the lifetime of object

[Singleton](#) - no comments

Structural

[Adapter/Wrapper](#) - converts one interface into another via inheritance or member

[Bridge](#) - decouples interface from implementation. If one fixed implementation - plmpl.

[Composite](#) - one object or a group of objects have one common interface (see text editor)

[Decorator](#) - additional functionality keeping the same interface

[Facade](#) - provide one interface to the set of interfaces/components

[Flyweight](#) - minimize memory for large amount of objects by sharing the same info (font graphics in the word processor or QContainers implementation)

[Proxy](#) - provides different functionality for the same interface, ATM to the bank, web proxy etc

Behavioral

[Chain of responsibility](#) - an object (request or command) is passed through a chain of objects which can process it and pass further or not

[Command](#) - putting the request into object, enables queueing, history, undo etc

[Iterator](#) - allows iteration over objects in an aggregate without exposing its internal structures

[Mediator](#) - decouples objects from each other easing maintaining applications (?)

[Memento](#) - allows saving/restoring internal object state. Originator provides memento objects to the outer world that contain originators state.

[NullObject](#) - object that implements an interface but does nothing. Used instead of returning NULL and checking against it

[Observer](#) - object with changing state notifies registered observers (observer interface)

[Publisher/Subscriber](#) - object publishes state changes in a form of messages to the subscribers. Sometimes a queue is involved, sometimes with message priorities.

[State](#) - object represents various states of some component. Each state may define separate implementation of set of operations (common interface) instead of set of switches.

[Strategy](#) - wrap a set of algorithms to perform some operations in wrapper and allow changing them at runtime.

[Template method](#) - defines algorithm/program skeleton with some steps and lets the subclasses implement these steps

[Visitor](#) - element->accept(visitor) { visitor->visit(this);} Double dynamic dispatch. Useful on iterations over larger number of objects (save doc elements, find, backup etc)

Concurrency

[Active Object](#) - async calling methods in object specific thread, callback for result, scheduler and a list of requests

[Double checked locking](#) - considered antipattern, require volatile keyword to work correctly

[Read-Write Lock](#) - multiple reads, single write

[Scheduler](#) - controls which thread or object can access resource with specified policy (avoiding starvation)

[Thread pool](#) - a few thread are pre-created and wait to perform tasks.

OS Messages - scheduler + active object + registration of handlers