

# Modellistica Medica

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# Lezione 2

## Esercitazione

Concetti tecnologici di base:

C++

Tecnologia OO

# Background: 1

1. Do you speak Fortran? C?
2. Do you speak C++?
3. Is C++ an object oriented language?
4. Do you speak Python? Java?
5. Do you speak UML?
6. Are you familiar with design patterns?
7. Have you ever used Rational Rose? Together?
8. Have you ever used Geant4? Geant3? Other Monte Carlo codes?
9. Have you ever used PAW? Anaphe? JAS? OpenScientist? ROOT?
10. Are you familiar with Unix? With Linux? With Windows?

# Basics: 1

1. What characterizes an object?
2. What is a class?
3. What is an abstract class?
4. What is an abstract interface?
5. What is encapsulation?
6. What is a global variable?
7. What is a namespace?
8. What happens if delete is called on a NULL pointer?
9. What happens when a pointer is deleted twice?
10. What is a memory leak?

# Basics: 2

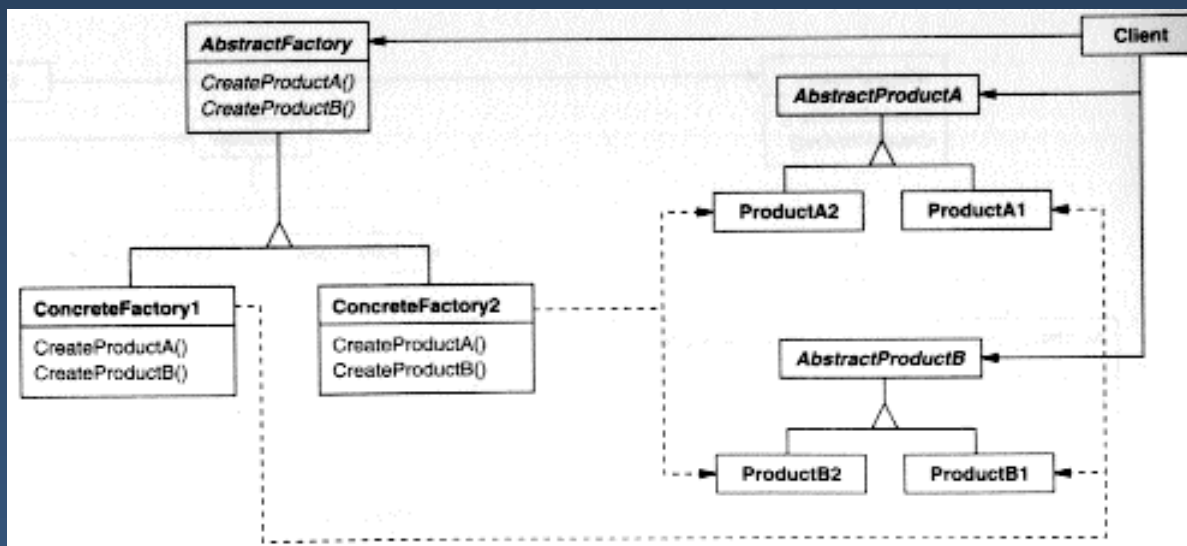
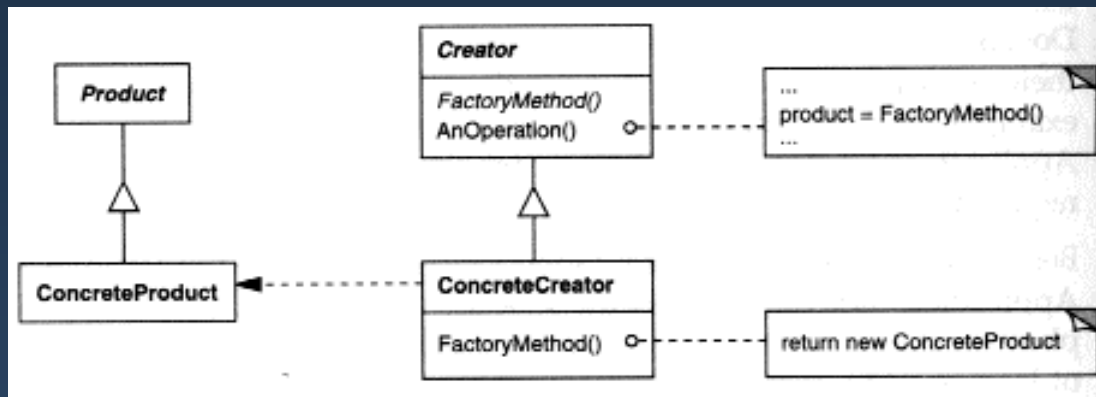
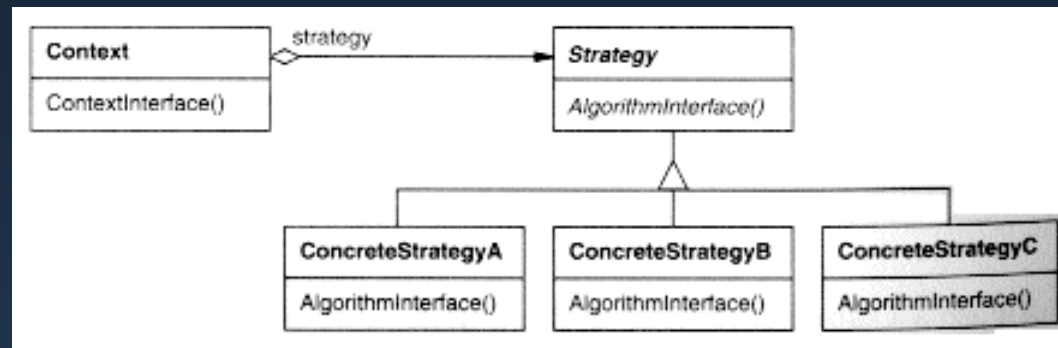
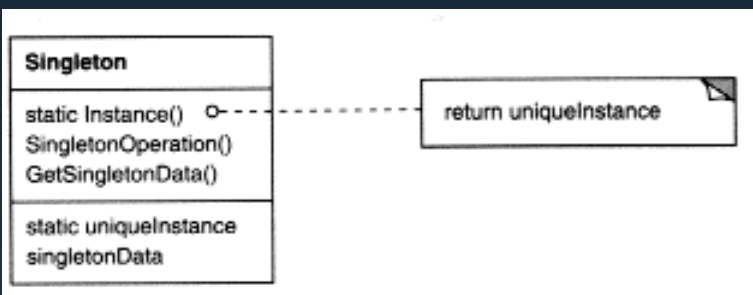
1. What is inheritance?
2. What is polymorphism?
3. What is dynamic binding?
4. What is a virtual member function?
5. What is a pure virtual member function?
6. What is function overloading?
7. What is function overriding?
8. What is function hiding?
9. What is an inline function?
10. What is the purpose of inlining a function?

# Basics: 3

1. What is a constructor?
2. What is a destructor?
3. What is a copy constructor?
4. When is a copy constructor called?
5. What happens if a class does not have a constructor?
6. How many constructors may a class have?
7. When is it imperative to declare a copy constructor and an assignment operator? Why?
8. What is dynamic type checking? Is it a good practice?
9. What is RTTI?
10. What is `dynamic_cast<T>(x)`?

# Basics: 4

1. What is a class template?
2. What is generic programming?
3. What is a component?
4. What is the STL?
5. What are STL components?
6. Please name the STL containers
7. Please explain the difference between a vector and an array
8. What do you do to loop over the elements of a vector?
9. What do you do to sort a vector?



What is described in these diagrams?