

# 1 Theory

For each of the statements below, please mark whether it is true or false:  
(+1 for correct answer, no change for wrong answer)

**An object is an instance of a specific class.**

☐ True



☐ False

**A Sequence diagram shows the order in which a system should be built.**

☐ False



☐ True

**A Use Case Diagram gives an overview of all use cases, the actors involved, the subsystems that each use case belong to, and how the use cases are related to each other.**

☐ True



☐ False

**A Class diagram show the methods and attributes that objects of each class contain.**

☐ True



☐ False

**You make one Interaction Diagram for each system event.**

☐ True



☐ False

**An Interaction Diagram describe the interaction between differen classes.**

☐ False



☐ True

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Maximum marks: 6

## 2 GRASP Patterns

For each of the statements below, please mark whether it is true or false:  
(+1 for correct answer, no change for wrong answer)

**Information Expert means that the responsibility for working with some specific information should reside with the class that contains the information.**

☐ True



☐ False

**Information Expert means that you should put the information in the class that has the methods to work with it.**

☐ True



☐ False

**Responsibility driven design means that you must always document who is responsible for each design decision so that you can exert responsibility when something goes wrong.**

☐ False



☐ True

**High Cohesion means that each class should have as few and as well defined areas of responsibility as possible.**

☐ False

☐ True



**Low Coupling means that you should strive to have as few and as "loose" associations as possible between classes in a system.**

☐ False

☐ True



**Controllers can call other Controllers.**

☐ True



☐ False

**A Controller can call Information Experts.**

☐ True



☐ False

**Controller requires Polymorphism in order to work.**

☐ True

☐ False



**There can only be one instance of an Information Expert in a system.**

☐ True

☐ False



**According to High Cohesion each class should do as much as possible.**

☐ True

☐ False



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Maximum marks: 10

### 3 Design Patterns

For each of the statements below, please mark whether it is true or false:  
(+1 for correct answer, no change for wrong answer)

**An Observable is a class with data that other classes may be interested of.**

☐ True



☐ False

**The Observer Pattern consist of Observers that regularly look for changes in classes of the type Observable.**

☐ False



☐ True

**The object main:GUIController, which is a Controller, is responsible for controlling that the user is using the user interface correctly.**

☐ False



☐ True

**The object main:GUIController, which is a Controller, is responsible for passing on events that the user generates in the user interface to other parts of the application that will do the actual work.**

☐ False

☐ True



**A Strategy Pattern consist of at least three classes with the roles Context, AbstractStrategy, and ConcreteStrategy.**

☐ False

☐ True



**The design pattern Factory is a way to structure the system so that all data (Facts) is collected in as few classes as possible.**

☐ True

☐ False



**Singleton means that you are only allowed to call the class once.**

☐ True

☐ False



**In the State pattern, it is the class with the role «Abstract State» that is responsible for deciding which state to change to next.**

☐ False



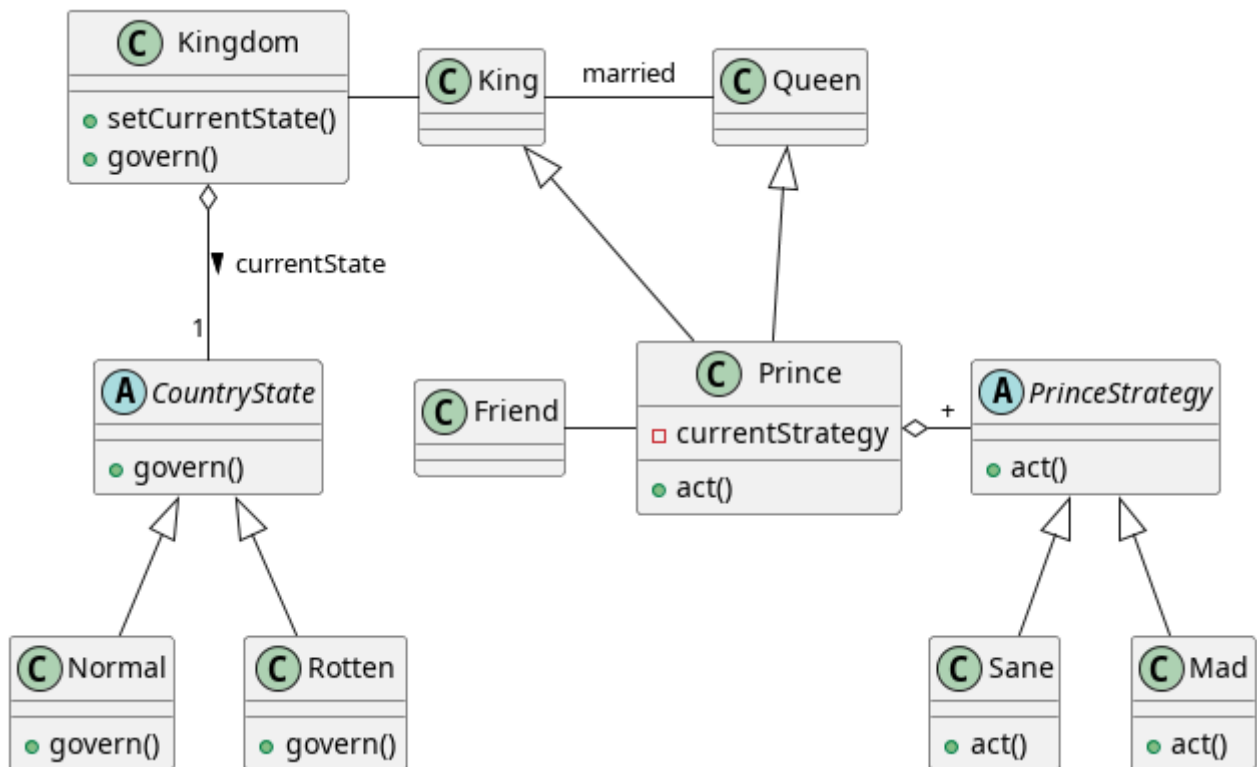
☐ True

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Maximum marks: 8

## 4 Class Diagram

Consider the class diagram below:



The class diagram describes relations from a play. For each of the statements below, please mark whether the diagram supports the statement (true) or does not support the statement (false). (+1 for correct answer, no change for wrong answer)

**hamlet:Prince has an association with ofelia:Friend**

☐ True



☐ False

**denmark:Kingdom can either be in the state currentState:Normal or currentState:Rotten**

☐ False

☐ True



**england:Kingdom can have both an association to currentState:Normal and currentState:Rotten at the same time.**

☐ False



☐ True

**hamlet:Prince has an association with denmark:Kingdom**

☐ True



☐ False

**gertrude:Queen can not goven denmark:Kingdom**

☐ True



☐ False

**hamlet:Prince can act both according to Sane::act() and Mad::act() at the same time.**

☐ True



☐ False

**horatio:Friend always know whether hamlet:Prince is acting Sane or Mad.**

☐ True

☐ False



**gertrude:Queen is married to claudius:King**

☐ False

☐ True





**sweden:Kingdom** no longer knows exactly which **CountryState** it has, only that it has a reference to some object of the type **CountryState**.

☐ False

☐ True



**It is polonius:CountryState** that through the method **CountryState::govern()** decides whether the country should be ruled as **Normal::govern()** or **Rotten::govern()**.

☐ True

☐ False



**hamlet:Prince** is a **Queen** ☐ ☐

☐ False

☐ True



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Maximum marks: 11

## 5 Relations between Classes

Consider the class diagram below:



The class diagram describes how customers may have different service plans (e.g. mobile phone plans). For each of the statements below, please mark whether the diagram supports the statement (true) or does not support the statement (false).

(+1 for correct answer, no change for wrong answer)

**anthony:Subscriber is using the same :Tariff all times of the day**

☐ False

☐ True



**prepaid:ServicePlan and mini:ServicePlan uses nightPrice:Tariff**

☐ True



☐ False

**bob:Subscriber and charlie:Subscriber use the same :ServicePlan**

☐ True



☐ False

**david:Subscriber has a workPhone:ServicePlan and a burnerPhone:ServicePlan**

☐ False



☐ True

**x:Tariff and y:Tariff both have the price 2 SEK and is valid between 07:00 and 17:00**

☐ True



☐ False

**doppio:ServicePlan contains both x:Tariff and y:Tariff with the price 2 SEK and valid between 07:00 and 17:00.**

☐ True



☐ False

**flex:ServicePlan has a separate :Tariff for every hour of the day.**

☐ True

☐ False



**whistle:ServicePlan does not have any Tariff.**

☐ False



☐ True

**When eric:Subscriber wants to trade up to maxi:ServicePlan, they must first cancel his mini:ServicePlan**

☐ True



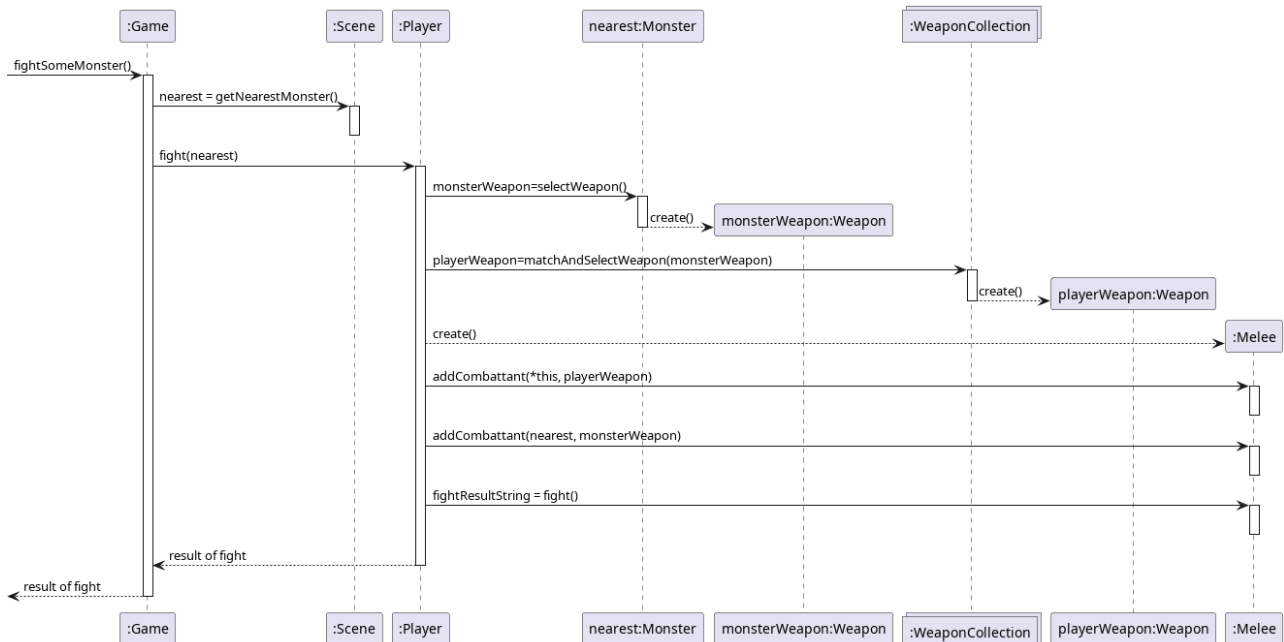
☐ False

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Maximum marks: 9

## 6 Interaction Diagram

Consider the sequence diagram below:



The interaction diagram show the system event `fightSomeMonster()` in a text based adventure game. For each of the statements below, please mark whether the diagram supports the statement (true) or does not support the statement (false).  
(+1 for correct answer, no change for wrong answer)

**Monsters do not have any Weapons ready and have to create them when needed.**

☐ False

☐ True



**:Scene is information expert on which Monsters that are in the vicinity.**

☐ True



☐ False

**:Player is information expert on which weapons they have**

☐ True

☐ False



Since you must take the surroundings into consideration when fighting, it is :Scene who is information expert on how to conduct a fight()

☐ True

☐ False



The classes Game, Player, and Melee each have a method named fight()

☐ False



☐ True

The object :Scene receives the result from Melee::fight() and reformats it so that it can be displayed in the user interface.

☐ True

☐ False



:Player is a controller.

☐ True



☐ False

The class Melee must have two methods that are both named addCombattant()

☐ False



☐ True

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Maximum marks: 8

## i Grade limits

The grade limits for this exam are:

| Betyg | Procent | Poäng |
|-------|---------|-------|
| MAX   | 100%    | 52    |
| A     | 90%     | 47    |
| B     | 80%     | 42    |
| C     | 70%     | 36    |
| D     | 65%     | 34    |
| E     | 60%     | 31    |

**Good luck!**