

**INSTITUTE OF TECHNOLOGY CARLOW**

No: ???S

**SCHOOL OF SCIENCE**

**DEPARTMENT OF COMPUTING AND NETWORKING**

**SUMMER EXAMINATIONS 2012**

**COURSE CODE: CW131-2**

**DATE: ?**

**TIME: ?**

**Course Title: Bachelor of Science (Honours) in Computer Games Development**

**Course Year: 2**

**Subject: Software Engineering for Games I**

**Duration: 3 Hours**

**Examiners: Dr C Meudec  
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**SPECIAL REQUIREMENTS:**

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**INSTRUCTIONS TO CANDIDATE:**

- 1. Write your Name, Course, Course Year and Class Group on your answer book;**
- 2. Marks as indicated in brackets;**
- 3. Answer Question 1 and two other Questions.**

## Question 1 {Compulsory} [50 Marks]

Consider the following game description:

*We wish to develop an object oriented, multi-platform, mini game where 2 human players move around (left, right, up, down) in a 2D arena and try to collect small goodies that appear, and disappear after a certain amount of time, at random in the arena. Players may collide against each other in a manner that has not yet been decided.*

*The goodies have different values (e.g. +2, -5, +3) and different appearances.*

*The first player to reach a certain set score wins.*

*The options that can be set before the game starts are:*

- *the maximum length of a game in seconds;*
- *the score to reach;*
- *the pace at which the goodies appear and disappear.*

*The game should fun and fast paced.*

### a) [3 Marks]

Draw a suitable use case diagram which must includes a clock as an actor controlling an “Update Game State” use case.

### b) [7 Marks]

Write all your use cases in a fully detailed style using the following format:

- name:
- actor(s):
- description:
- main success scenario:
- alternatives:

### c) [10 Marks]

Draw a rich UML domain model that supports fully the entire game as described.

### d) [5 Marks]

Draw the necessary UML system sequence diagrams for all your use cases.

### e) [10 Marks]

Only considering the postconditions, write the contracts for the system operations of the “Play Game” and “Update Game State” use cases.

### f) [10 Marks]

Draw the necessary UML interaction diagrams for the “Play Game” and “Update Game State” use cases.

### g) [5 Marks]

Draw the UML design class diagram of your work so far to support the “Play Game” and “Update Game State” use cases.

## **Question 2 [25 Marks]**

### **a) [5 Marks]**

What is the main purpose of System Sequence Diagrams?

### **b) [20 Marks]**

Give a plausible, but rough, day by day, schedule of the potential activities for a project's 2<sup>nd</sup> iteration lasting 3 weeks and using an agile version of the Unified Process; mention UML and non-UML artefacts started or refined along the way.

## **Question 3 [25 Marks]**

### **a) [12 Marks]**

Describe what are, in your opinion, the top 2 main problems associated with high levels of coupling in an object oriented design.

### **b) [13 Marks]**

Explain the “Gang of Four” Factory design pattern. Use Examples.

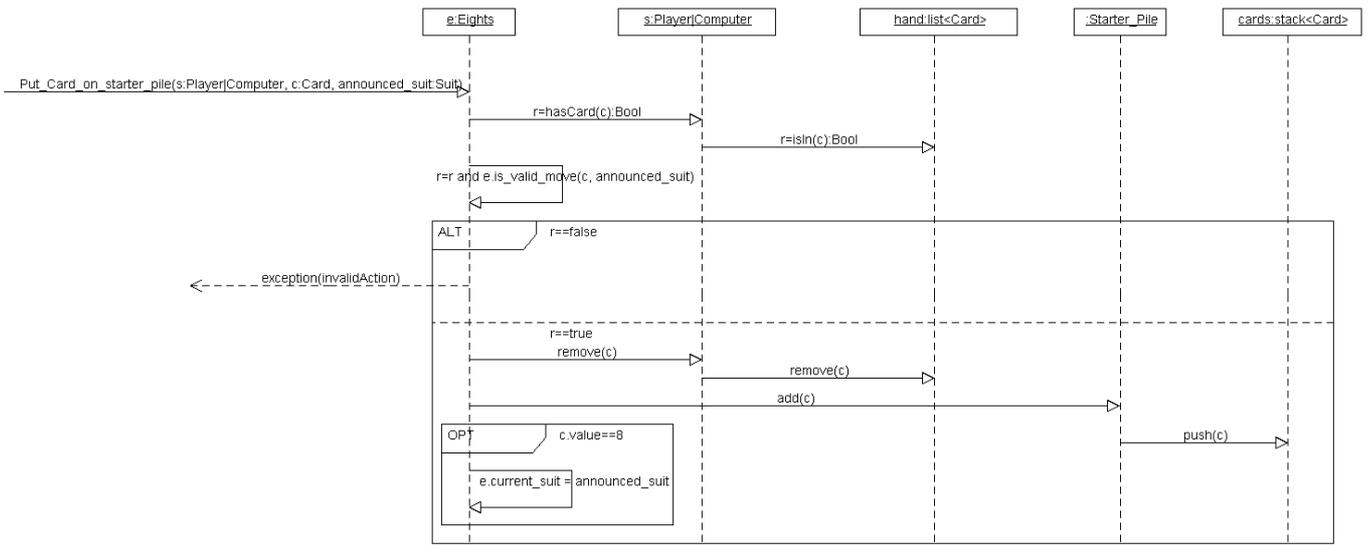
## Question 4 [25 Marks]

### a) [8 Marks]

What is data-driven design? What are its benefits? What are its disadvantages? Explain an example of its usage in games development.

### b) [8 Marks]

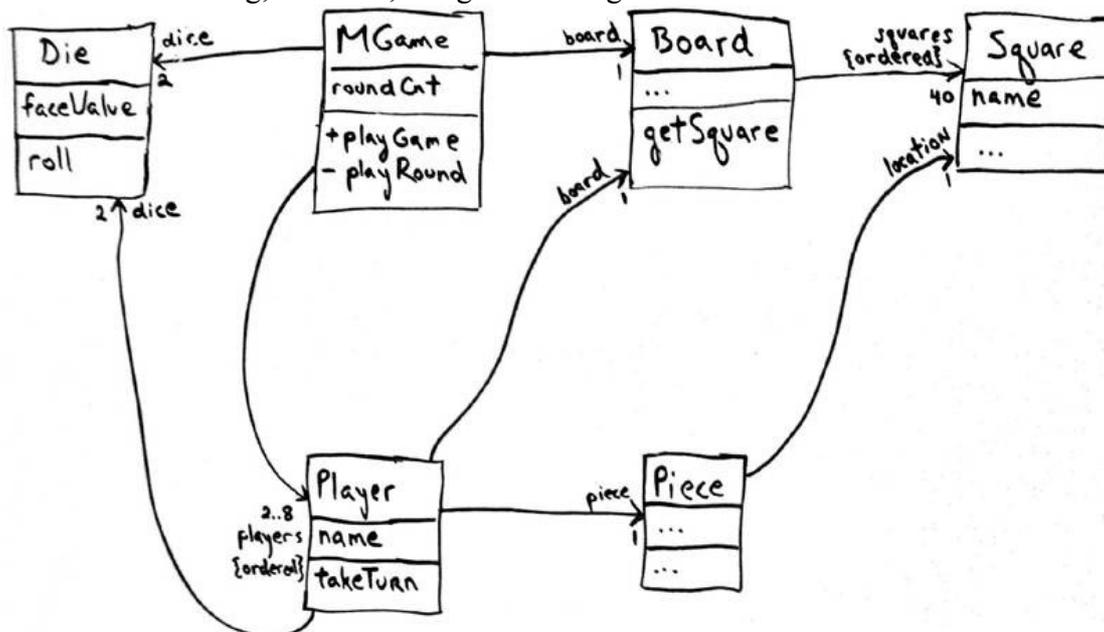
Given the following interaction diagram:



write the code, using any suitable notation, for the `Put_Card_on_starter_pile` method.

### c) [9 Marks]

Given the following, informal, design class diagram:

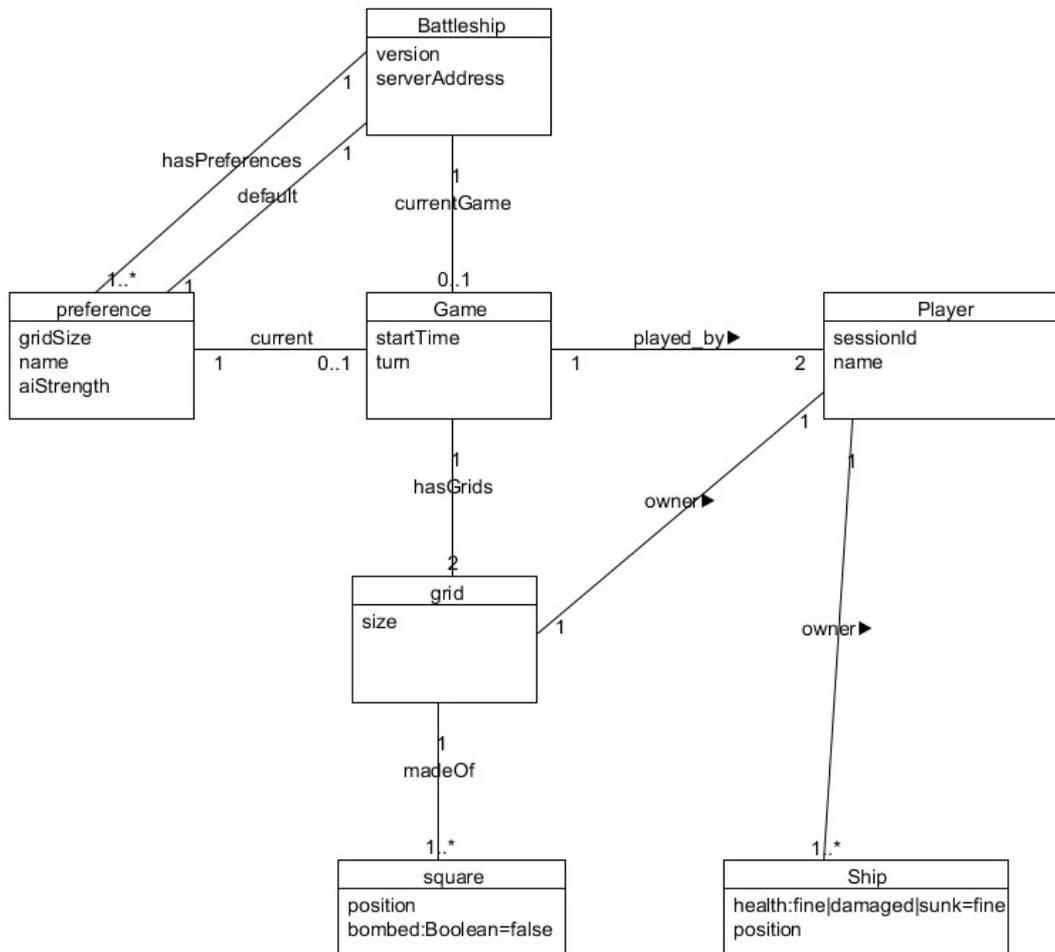


write, using any suitable notation, the code corresponding to all the classes mentioned. Note that you are not required to write the methods' code.

## Question 5 [25 Marks]

### a) [15 Marks]

In your opinion, what is the main problem with the following domain model proposal for a Battle Ship game? Explain the consequences of the problem and how you would improve the proposed domain model.



### b) [5 Marks]

What is the purpose of the Vision document in the Unified Process?

### c) [5 Marks]

In your view, what is, or are, the most useful artefact, or artefacts, created during UML software design? Justify your answer.