

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:

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 2nd 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.

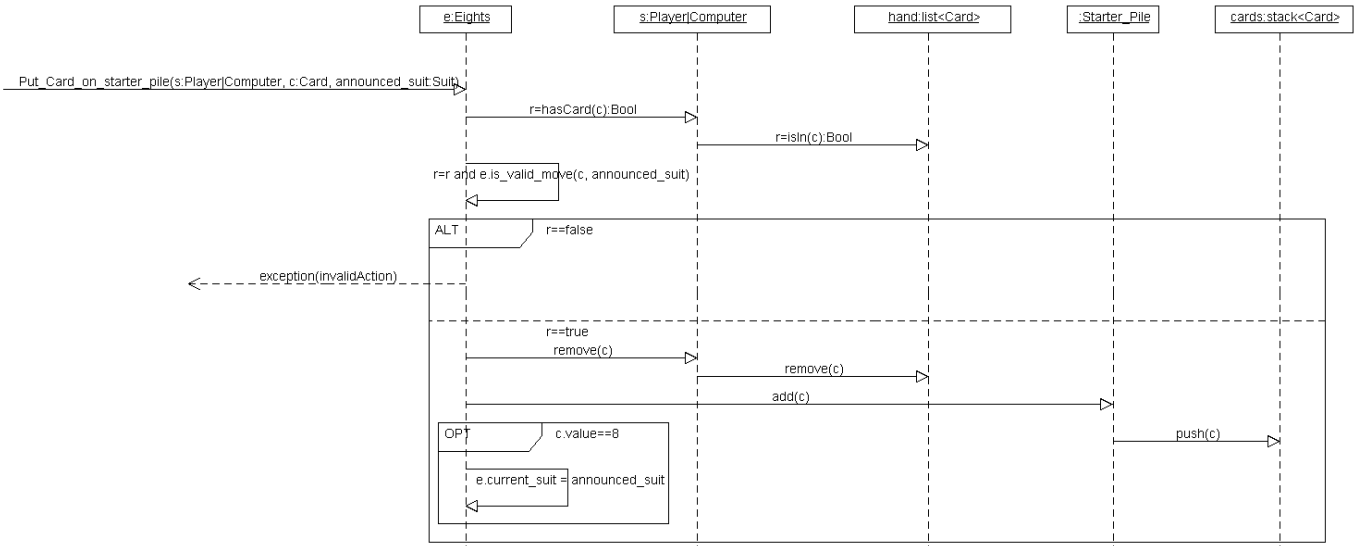
Question 4 [25 Marks]

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]

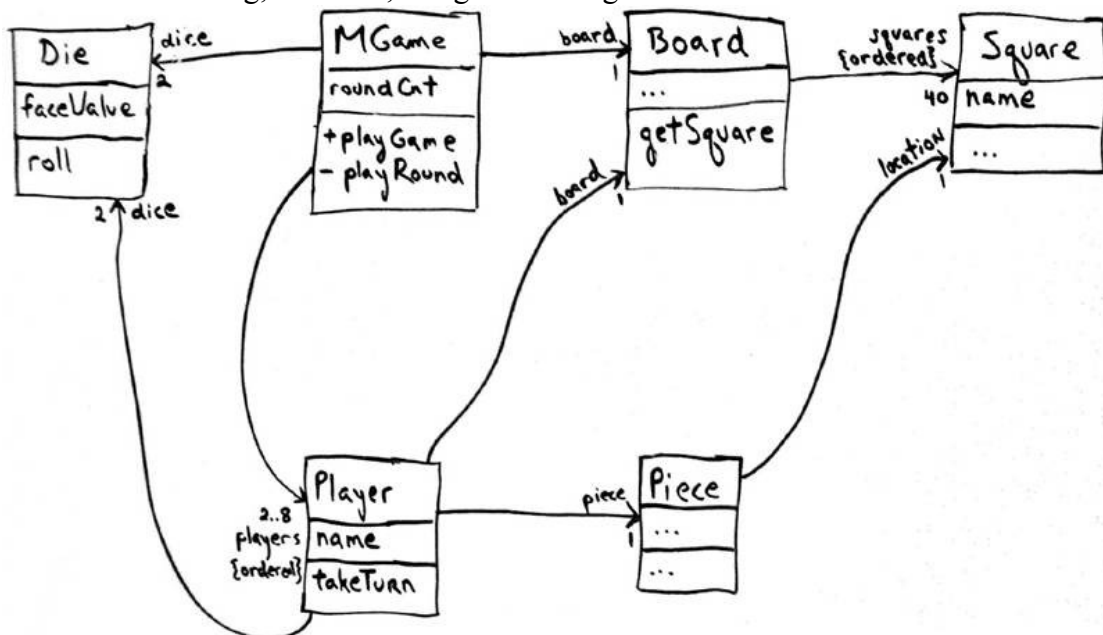
Given the following interaction diagram:



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:

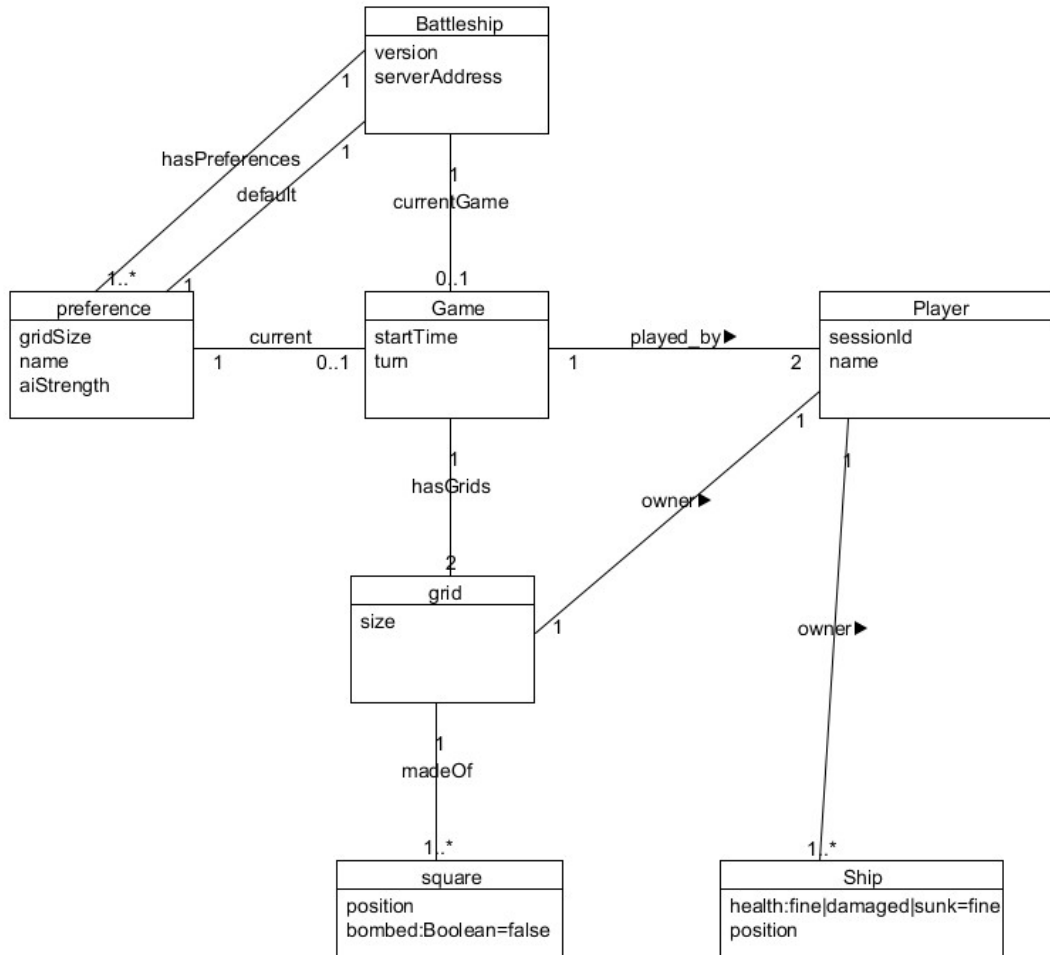


write, using any suitable notation, the code corresponding to all the classes mentioned. Note that you are not required to write the methods' code.

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.