

INSTITUTE OF TECHNOLOGY CARLOW

No: ???S

SCHOOL OF SCIENCE

DEPARTMENT OF COMPUTING AND NETWORKING

SUMMER EXAMINATIONS 2010

COURSE CODE: CW131-2

DATE: ?

TIME: ?

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

Course Year: 2

Subject: Games Engineering I

Duration: 3 Hours

Examiners: Dr C Meudec

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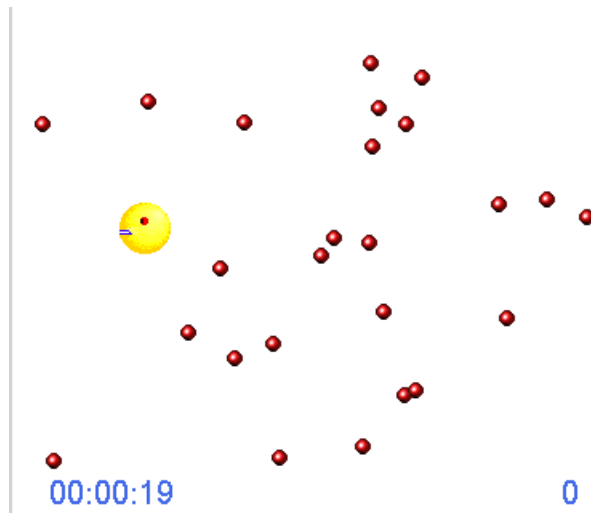
SPECIAL REQUIREMENTS:

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]

We wish to develop a simple pac-man like game in which the user moves around the game area and gobbles up goodies that are moving around slowly randomly. The purpose of the game is to get all the dots in as quick a time as you can. This simple game is to be developed for the mobile market and must therefore be readily portable due to the fast pace of change of this target market.



[<http://www.c-sharpcorner.com/UploadFile/mgold/EaterGame11142005060926AM/EaterGame.aspx>]

The bottom right of the screen shows the number of goodies eaten, and the bottom left the time elapsed so far. The user should be able to access a set-up menu to configure the game (e.g. for the number of goodies available and their velocity) that the application should remember at start up time as the default setting. Previous settings must be available too. Fastest times of a particular setting must be recorded and viewable by the player.

a) [4 Marks]

Draw a suitable use case diagram for the game as described.

b) [6 Marks]

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

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

c) [10 Marks]

Draw a rich UML domain model to fully support the entire game as described.

d) [5 Marks]

Draw the necessary UML system sequence diagrams for the “play” and “update game state” use cases.

e) [10 Marks]

Only considering the postconditions, write the contracts for the system operations of the “play” and “update game state” use cases.

f) [10 Marks]

Draw the necessary UML interaction diagrams for the “play” and “update game state” use cases.

g) [5 Marks]

Draw the UML design class diagram of your work so far to support the “play” and “update game state” use cases.

Question 2 [25 Marks]

a) [15 Marks]

Describe the Elaboration phase of the unified process under the following headings:

1. Main purpose of the elaboration;
2. Activities and artefacts of the UP elaboration phase;
3. When should the transition to the construction phase occur?

b) [10 Marks]

What is meant by an 'evolutionary software development process' ? Can you name one?

Question 3 [25 Marks]

a) [15 Marks]

Explain the rationale behind, and the solutions offered by, the adapter design pattern.

b) [10 Marks]

Why is low coupling an important characteristic of an OO design?

Question 4 [25 Marks]

a) [20 Marks]

Considering the following game:

There is a player and a target. Initially the player is idle and the target is hidden. The player's goal is to hit as many times as possible a target appearing at a random position in a two dimensional board.

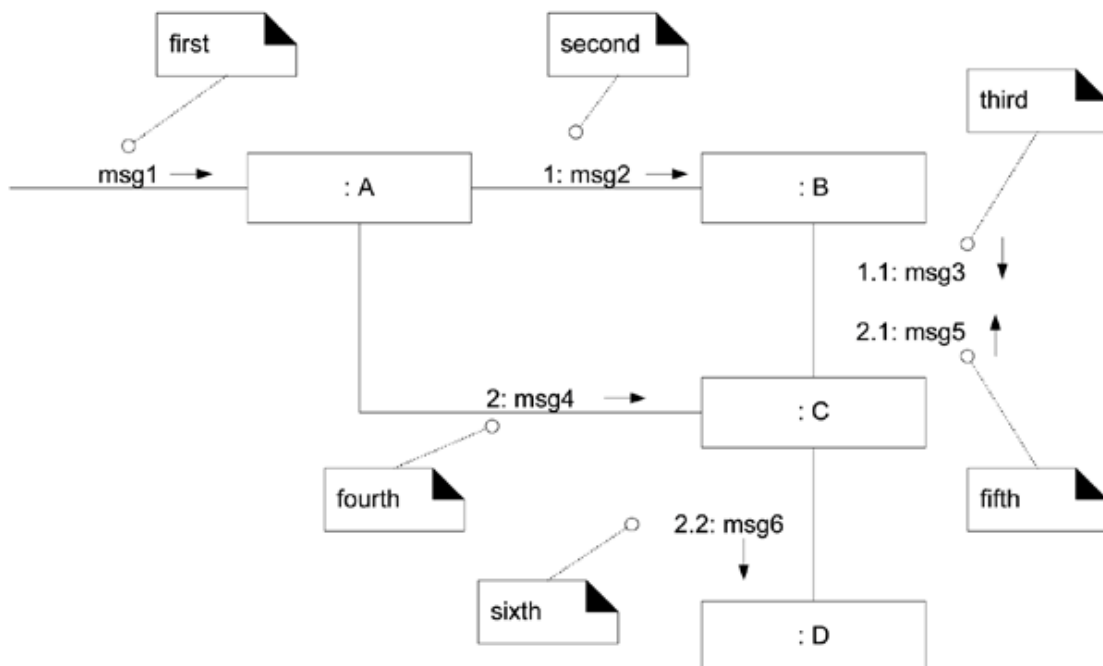
- The target shows up at a random position on the board at random times. The target stays up until the player fires or until a variable amount of time has elapsed and then is hidden again from the player's sight;*
- The player stays idle until he receives a signal that a target has shown up, at that point the player may aim at the target and may fire at the aimed position.*

If the target position matches the player's aimed position the target is hit, the player wins a point and goes into idle state, while the target is hidden. Otherwise the player does not win a point, but again he goes in idle state, and the target is hidden.

Draw the state diagram for the player object and the state diagram for the target object and relate the two showing the messages that are exchanged between the two objects. You should take care to label each transition, not just with the event that causes it, but also with a guard and associated actions where appropriate.

b) [5 Marks]

Draw an equivalent sequence diagram to the diagram below.



Question 5 [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) [5 Marks]

What role do interaction diagrams play during the coding phase?

c) [6 Marks]

In the UP, what is the contents of a typical supplementary specification?

d) [6 Marks]

Describe the advantages and disadvantages of a UML tool of your choice, that you have used, for agile development purposes.