

UNIVERSITY OF ESSEX

Undergraduate Examinations 2011

VIRTUAL WORLDS

Time allowed: **TWO** hours

The paper consists of **FIVE** questions.

Candidates must answer **ALL** questions.

The questions are of equal weight.

The percentages shown in brackets provide an indication of the proportion of the total marks for the **PAPER** which will be allocated.

**Please do not leave your seat unless you are given permission by an invigilator.
Do not communicate in any way with any other candidate in the examination room.**

Do not open the question paper until told to do so.

All answers must be written in the answer book(s) provided.

All rough work must be written in the answer book(s) provided. A line should be drawn through any rough work to indicate to the examiner that it is not part of the work to be marked.

At the end of the examination, remain seated until your answer book(s) have been collected and you have been told you may leave.

Question 1

- (a) [4%]

Consider the following Lua function definition:

```
function f(x, y)
    z=x/y
    return z-z%1, z%1
end
```

State what would be printed in each of the following cases:

- (i) `print(f(7, 2))`
 - (ii) `print(f(3, 4, 5))`
 - (iii) `print(f(f(36, 8)))`
 - (iv) `a, b, c = f(5, 4), f(12, 5); print(b)`
- (b) [8%]
- (i) Explain, with the aid of an example, the meaning of the `...` expression in Lua.
 - (ii) Without using the Lua function `unpack`, write a Lua function that has the same functionality as `unpack`.
- (c) [8%]
- (i) Describe the purpose of an *iterator* function in Lua.
 - (ii) Briefly explain why iterator functions are usually implemented using *closures*.
 - (iii) Write an iterator function, `vals`, such that the following chunk will print the values 14, 28 and 57:
`for v in vals{14, 28, 57} do print(v) end`

Question 2

- (a) [3%]
- Give **two** examples of **each** of the following types of virtual world:
- (i) Social world.
 - (ii) Game world.
 - (iii) Balanced world.
- (b) [4%]
- Briefly* describe the primary design differences between social worlds, game worlds and balanced worlds.
- (c) [5%]
- In the years 1989-1991, there was a schism in virtual worlds. *Briefly* outline the causes and effects of this schism.
- (d) [8%]
- Speculate as to whether or not some time in the next ten years virtual worlds will undergo another schism.

Question 3

- (a) [5%]
Virtual world designers must decide what to do when player characters reach the edges of their virtual world. One approach is to have the world map wrap round so that the character reappears seamlessly on the opposite edge.

Suggest **five** other methods designers can use to handle edge-of-world boundaries.
- (b) [10%]
In today's MMORPGs it is common to have zones with very different climates in close proximity. For example, *World of Warcraft* has areas of desert, jungle, tundra, grassland and marsh less than 4km apart from each other.

Explain why this did not happen in the early days of virtual worlds and why it does happen today.
- (c) [5%]
Early virtual worlds were capable of implementing *instances*, but designers very rarely found them necessary. Explain why the designers of modern MMORPGs do tend to find them necessary.

Question 4

- (a) [5%]
When players new to virtual worlds start to play, they typically begin by behaving in one of two ways.
(i) State the names of the player types associated with these **two** ways of behaving.
(ii) Briefly describe what **each** of these two behaviours usually involves.
(iii) State the name of the step of the Hero's Journey that corresponds to this stage of player development.
- (b) [10%]
(i) State the *main sequence* for player type development.
(ii) Outline the differences between the *main socialiser sequence* and *main explorer sequence* for player type progression.
(iii) Explain why the player types model could initially capture the main sequence but not the main socialiser or explorer sequences.
- (c) [5%]
A celebrity claims to have played a virtual world incognito. He says that although he originally started out to play with his friends and ran a successful guild for a while, nowadays he mainly explores obscure content trying to figure out the inner workings of the game.

Assess the likelihood that the celebrity is lying.

Question 5

- (a) [9%]
Suppose that a court determined that the players of MMORPGs had ownership of the objects that their in-world characters possessed. Outline **three** ways this would adversely affect virtual world development.
- (b) [11%]
This morning, I gave 100,000 Linden dollars to a friend in *Second Life*. I could instead have sold them on the open market for 395 US dollars. My friend wants to know whether or not the gift should count as income for tax purposes.
- (i) Outline an argument that either supports or opposes the suggestion that my gift of L\$100,000 should be taxable.
 - (ii) Discuss whether or not your argument would still hold if, instead of giving my friend L\$100,000, I had given her 128,000 gold pieces in *World of Warcraft* (a sum which also has a current market value of \$395).

END OF PAPER CE317-6-SP