



The University of Fiji



Undergraduate Programme
Department of Computer Science & Information Technology
Semester 1 Year 2016

FINAL COURSE EXAMINATION PAPER

ITC 325: GAMES PROGRAMMING TECHNIQUES

Important Instructions to Students:

1. Read the questions, instructions carefully and answer the questions.
2. You are allowed an **extra 10 minutes reading time** (during this time, you are not allowed to write with pen) and **180 minutes (3 Hours) to complete this paper.**
3. Silent, non-programmable calculators are allowed, but not supplied.
4. Write all your answers in the answer booklet provided. If you need extra sheets, please ask from the supervisor. Write your name, course code and student identification number in the answer booklet and in the attendance sheet.
5. **This Final Course Examination Paper is worth 100 marks contributes 50% of the total course assessments.**
6. This paper contains three (3) sections A, B, and C. All questions are compulsory to answer.
7. Write all your answers legibly. The marker has the right to award zero for answers that are not legible.
8. This is a **Closed Book Examination**. The University views plagiarism, cheating and dishonest practice as serious offences and if found, offenders are penalized.

Examination Paper Content (Format):

<u>Section</u>	<u>Question</u>	<u>Content</u>	<u>Marks</u>	<u>Suggested Time</u>
A	1-20	Multiple Choice	20	30 Minutes
B	1-4	Short Answer Questions	60	120 Minutes
C	1-2	Long Answer Questions	20	30 Minutes
		TOTAL	100	180 Minutes

SECTION A: MULTIPLE CHOICE**20 Marks**

Write the question number and the letter representing the best answer in the answer booklet.

1. Actual things such as images or videos or pictures or music.
 - a. Using (C# Statement)
 - b. Content (C#)
 - c. Enum
 - d. UnloadContent (XNA Method)
2. Handle any game logic such as reading the keyboard or controllers or moving sprites or etc.
 - a. Update (XNA Method)
 - b. Array
 - c. Selection
 - d. Bug (C#)
3. Declare local variables and constants type _____ followed by identifier.
 - a. Float (C#)
 - b. Class (C# Type)
 - c. Solution
 - d. Declaration (C# Statement)
4. Game Content Pipeline: 1. Create content 2. Build into game 3. _____ 4. Package Game.
 - a. Draw (XNA Method)
 - b. LoadContent (XNA Method)
 - c. Statement (C#)
 - d. Write and Test
5. Programs must describe two things, what data the program works on and what _____ the program does on the data.
 - a. Actions
 - b. Jump (C# Statement)
 - c. Unsigned Simple Types
 - d. Expression (C#)
6. Mark code or phases that aren't read by program _____ marked with // or / and /.
 - a. Access Modifiers
 - b. Comments (C#)
 - c. Program
 - d. Array
7. Unload anything that is not part of the ContentManager.
 - a. Operators (C#)
 - b. UnloadContent (XNA Method)
 - c. Class
 - d. Private (C# Accessibility)
8. Set up anything related to your game that's not content related.
 - a. Initialize (XNA Method)
 - b. Cast (C#)
 - c. Private (C# Accessibility)
 - d. Array
9. Visual Studio is an _____.
 - a. Block (C# Statement)
 - b. IDE (Integrated Development Environment)
 - c. Iteration (C# Statement)
 - d. Bug (C#)
10. Repeatedly execute the statement { while – do – for- foreach }.
 - a. Private (C# Accessibility)
 - b. Expression (C# Statement)
 - c. Iteration (C# Statement)
 - d. Update (XNA Method)

11. Data structure that combines fields and methods in a single unit (may be user defined).
 - a. Actions
 - b. Breakpoint (C#)
 - c. Breakpoint (C#)
 - d. Float (C#)
12. Holds content and programming code.
 - a. Iteration (C# Statement)
 - b. Instance
 - c. Solution
 - d. Breakpoint (C#)
13. Consists of a list of statements written between delimiters { and }.
 - a. Signed Simple Types (C#)
 - b. Using (C# Statement)
 - c. Block (C# Statement)
 - d. Statement (C#)
14. Draw everything on the screen.
 - a. Update (XNA Method)
 - b. Block (C# Statement)
 - c. Unsigned Simple Types
 - d. Draw XNA Method)
15. Predefined reserved identifiers that have special meaning.
 - a. Equality
 - b. Initialize(XNA Method)
 - c. Keywords (C#)
 - d. UnloadContent (XNA Method)
16. You are in the cockpit of a jet transporting explosives and weapons back and forth between neighboring countries. The controls in the cockpit are so detailed that you must read the thick game manual thoroughly before even beginning to master them. The rules for navigating this aircraft correspond in excruciating detail to real-world rules. What type of game are you playing?
 - a. Action
 - b. Simulation
 - c. Puzzle
 - d. Role-Playing
17. You are working in the market department at Electronics Arts. Your supervisor has given you the task of putting together a special "Game Signing" event at the local Gamestop retailer. This type of marketing is known as _____.
 - a. Sales
 - b. Public Relations
 - c. Promotion
 - d. Market Research
18. You are running quickly through dangerous terrain, bow and arrow in hand, stalking the enemy predators that have landed on your island. You see the environment through the eyes of your characters at all times and you are also able to see your character's weapon in the bottom foreground of the screen. As the enemy spots you and reacts, you think quickly and draw your bow vanquishing your foe in a fraction of a second. What type of game are you playing?
 - a. Action
 - b. Adventure
 - c. Puzzle
 - d. Role-Playing
19. In a puzzle game, players race against time to search for words hidden in a grid of letters. Since there's specific time allocated for each word search, the time interval used in this game is known as what?
 - a. Part-Time
 - b. Real-Time
 - c. Player-Adjusted
 - d. Time-Limited

20. What type of platform is best suited to local play?

- a. Arcade
- b. Console
- c. Computer
- d. Mobile

SECTION B: SHORT ANSWER QUESTIONS

60 Marks

All questions in this section are compulsory.

Question 1 – Computers, C#, XNA and You & Programs, Data and Adding Colors

[15 Marks]

- A. It is said that programming is not rocket science and that there are many people in the world who have learned programming than rocket science. What are the keys to learning programming?
(2 Marks)
- B. People think that great programmers can type a thousand words a second, have a mega-sized brain, and are fitted with a socket that lets them connect directly to a computer. Well this is not true. In your own terms elaborate on the term "Becoming a Great Programmer".
(2 Marks)
- C. Explain why it is easy to use C# programming language than compared to using any other type of programming language? Describe what you understand by the terms Software Development Kit (SDK) and Integrated Development Environment (IDE).
(1.5 Marks)
- D. When you click on the button to run the program or game, a number of things happen in quick succession. Describe the steps what actually happens.
(2 Marks)
- E. In our discussions there were numerous times the word *method* came across. Explain what *method* means in the context of C# and also provide an example of how a method written C# will look like.
(1 Mark)
- F. Explain what these methods are doing in the XNA visual studios:
(3.5 Marks)
- I. Game1()
 - II. Initialize()
 - III. LoadContent()
 - IV. Run()
 - V. Update()
 - VI. Draw()
 - VII. UnloadContent()
- G. Write the line of code that will make the background of your game or screen to color *Green*.
(1 Mark)

H. The below code is of a *Draw Method*, explain in your words what is the method doing.

(1 Mark)

```
protected override void Draw (GameTime gameTime)
{
    Color backgroundColor;
    backgroundColor = new Color (255, 255, 0);
    graphicsDevice.Clear (backgroundColor);
    base.Draw (gameTime);
}
```

I. Why is it a bad idea to start a huge game project on your own, especially if it's your first game?

(1 Mark)

Question 2 – Getting Player Input & Adding Images, Sound and Text

[20 Marks]

A. Write the series of codes for the update method to enable a person pressing the *Enter* key on the keyboard and enabling the *redIntensity* to keep increasing. You can assume that the *redIntensity* in this case is the color *Red*.

(2 Marks)

B. Explain the term *GetState* and where in the *Game1.cs* class it is being used?

(1 Mark)

C. Write the series of codes for the update method where by it will allow the users to press '*R*', '*B*', and '*G*' on the keyboards and on the screen the colors *Red*, *Blue*, and *Green* increases. Be sure to use proper declarations.

(3 Marks)

D. What parts of your game should you think about while designing it?

(1 Mark)

E. Why is it important to think about your design before you start writing any code?

(1 Mark)

F. Many terms used in game programming jargon describe specific uses of graphics in a game. Explain the differences between: *Sprite*, *Billboard*, and *Tiles*.

(1.5 Marks)

G. The given code creates a *Sprite* class. Explain what the properties of the *sprite* class are.

(2 Marks)

```
using Microsoft.Xna.Framework.Graphics;
using Microsoft.Xna.Framework;
class clsSprite
{
    public Texture2D texture { get; set; }
    public Vector2 position { get; set; }
    public Vector2 size { get; set; }
    public clsSprite (Texture2D newTexture, Vector2 newPosition,
        Vector2 newSize)
    {
        texture = newTexture;
        position = newPosition;
        size = newSize;
    }
}
```

- H. Write the entire series of code to draw an image on the game screen. Note the entire coding will go inside the draw method and don't forget to declare and initialize the rectangle and textures. **(3 Marks)**
- I. Sounds are just another item of content, along with images and fonts. You add them to your project in the same way you add pictures in the project. Write the C# statements to load a sound file named *kick.mp3* in the *LoadContent* method. **(2.5 Marks)**
- J. I have a sprite named *monkey* in my contents folder. What you have to do is to load the sprite to *Game1.cs* and enable users to move the sprite using their keyboards in the game screen. The movement keys you need to use are left, right, up, and down arrow keys. **(3 Marks)**

Question 3 – Writing Text, Creating Multiplayer Game & Playing Sounds

[15 Marks]

- A. Write the steps in code and text format of how you are going to load a *font* through *Content Folder* and through *LoadContent()* method. **(3 Marks)**
- B. Write the entire draw method code that will show the text "Hello World" on the game screen. You can use the Vectors as 20 and 30. **(3 Marks)**
- C. What are the four parameters inside of a *.Play()* method? **(2 Marks)**
- D. The below code is given of a Draw Method, explain what the method is doing. **(3 Marks)**

```
protected override void Draw(GameTime gameTime)
{
    graphics.GraphicsDevice.Clear(Color.CornflowerBlue);
    DateTime nowDateTime = DateTime.Now;
    string nowString = nowDateTime.ToLongTimeString();
    Vector2 nowVector = new Vector2(50, 400);
    spriteBatch.Begin();
    spriteBatch.DrawString(font, nowString, nowVector, Color.Red);
    spriteBatch.End();
    base.Draw(gameTime);
}
```

- E. Explain what do you understand by the term *Level* and an *Edge Detector*. **(2 Marks)**
- F. Write down the steps for loading a sound file called *share.mp3* through code in the *Game1.cs* class. **(2 Marks)**

Question 4 – Creating a Timer & Reading Text Input in XNA**[10 Marks]**

- A. At any given point in the process, the program would have an idea of the best result it has seen so far if it sees a value that is better, it now has a new winner, and so on if you think about it, this is what people really do, particularly if they are working through 1,000 numbers instead of only a few in that case, you would take care to remember the best result that you had seen so far as you went through and probably write it down on a piece of paper. With all this in mind, consider the following code and explain what the codes are doing. **(2.5 Marks)**

```
int winningValue = 120;
for (int i = 0; i < 16; i++)
{
    if (scores[i] > 0)
    {
        if (scores[i] < winningValue)
        {
            winningValue = scores[i];
        }
    }
}
```

- B. What does the term *Garbage Collector* mean in XNA Games Studio? **(1 Mark)**
- C. Refer to the update method below. Explain what the method is doing and what will happen if one or more keys are pressed after the execution of the game? **(2.5 Marks)**

```
string msgString;
protected override void Update(GameTime gameTime)
{
    KeyboardState keyState = Keyboard.GetState();
    if ( keyState.IsKeyDown(Keys.Escape) )
    {
        this.Exit();
    }
    Keys[] pressedKeys;
    pressedKeys = keyState.GetPressedKeys();
    msgString = "";
    for (int i = 0; i < pressedKeys.Length; i++)
    {
        msgString = msgString + pressedKeys[i].ToString() + " ";
    }
    base.Update(gameTime);
}
```

- D. Differentiate the between the terms *IsKeyDown* and *IsKeyUp*, these functions are used in the update method and is triggered when a button is pressed. **(2 Marks)**
- E. Write the *if* condition that can check to see if the button 'A' is pressed or not. **(2 Marks)**

1. Discuss a game concept based on events from your own life. Choose something difficult or meaningful that you have experienced, something that changed you or made you who you are today. What were significant choices and challenges in this experience? Where did the resistance come from? Were there moments in which your experience felt more open to possibility or more constricted and constrained by what was happening around you? When did this experience get harder or easier? Describe how you would represent these things through a game system, and go into detail about how the rules of your game work and what various scenes might look like.
(10 Marks)
2. Find an example of a game with an authored story that has a definite ending, where the story associated with the game resolves and closes. Write a new ending for this game, either one that alters the events of the existing ending or goes past it, describing what happens moments or years after the official ending. Describe how this extension to the story would be supported with gameplay. As a continuation or change to the ending, would you introduce new verbs or objects? Talk about how you might use exploratory elements or story choices to support your new ending. Finally, evaluate your own new ending compared to the "official ending". If the ending you created became part of the official canon of this game's authored story, would it improve the game and players' experience of playing it? What are the pros and cons for your story becoming official?
(10 Marks)

THE END