# Assessment event 1 of 3: Knowledge

## Criteria

### Unit code and name

ICTPRG430 | Apply introductory object-oriented language skills

ICTPRG434 | Automate processes

ICTPRG439 | Use pre-existing components

ICTGAM423 | Apply artificial intelligence in game development

### Qualification/Course code and name

ICT40120 CERT IV in Information Technology Game Development

## Student details

Student name

Student number

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## Assessment instructions

Table Assessment instructions

| Assessment details | Instructions |
| --- | --- |
| **Assessment event overview** | The aim of this assessment event is to assess your knowledge and performance in introductory programming tasks using an object-oriented programming language including tool usage, documentation, debugging, and testing techniques.  Write scripts to automate solutions by using basic scripting processes and application-specific scripting options.  Identify, evaluate and incorporate pre-existing (re-use) components from a library, or other source, as part of a software project.  Research, develop and implement artificial intelligence (AI) solutions in games.  This assessment is in 3 parts:   * Part 1: Programming Basics * Part 2: Reusing Components * Part 3: Artificial Intelligence   And is supported by:   * Assessment feedback   **Note**: This assessment may contain links to external resources. Access to the long URL is provided via the External resources – Links and URLs section located at the end of this document. |
| **Unit assessment guide** | Refer to the unit assessment guide (UAG) before attempting this assessment event. The UAG contains information including assessment requirements and how to achieve a satisfactory result. |
| **Submission instructions** | When you complete this assessment, submit it for marking:   * keep a copy of all the electronic and hardcopy assessments you submit to TAFE NSW * make sure you have completed the assessment declaration before you submit. |

## Part 1: Programming Basics

1. List at least 5 different C# Syntax language rules.

| C# Syntax |
| --- |
| A line of code must end with a semicolon |
| An if statement’s condition is placed inside ( ), and its contents placed inside { } |
| The names of classes start with a capital letter, but most variables start with lowercase |
| A condition of a switch statement starts with “case: \_” where \_ is the value being tested and is ended by using “break;” |
|  |

1. Which of the following are built-in C# data types, indicate **True** or **False**.

| Data type | True or False |
| --- | --- |
| bool | True |
| bit | False |
| float | True |
| int | True |
| log | False |

1. Read the statement/s carefully and indicate **True** or **False**.

Table True or false

| Statement | True or False |
| --- | --- |
| A struct in C# is a simple data type that can hold multiple values of different types together. | True |

1. Read the following code and answer, what does the static keyword change about the numberOfWheels variable?

public class Car

{

public static int numberOfWheels = 4;

}

Static means the variable is attached to the class rather than an object. This means that there can only be one of this variable so any object accessing or changing it will change it for every object, and even if you destroy all objects using this variable, it will remain because it is attached to the class *not* the object.

1. Match the Description with the keyword that c# uses.

| Keywords | Answer | Description |
| --- | --- | --- |
| while | B | 1. Selection |
| for | B | 1. Iteration |
| if | A |  |
| foreach | B |  |
| switch | A |  |
| else | A |  |

1. Read the statement/s carefully and indicate **True** or **False**.

Table True or false

| Statement | True or False |
| --- | --- |
| C# code is run line by line, starting from the bottom and ending at the top. | False |

1. Explain the difference between inheritance and polymorphism in C#

Inheritance, in real life, is when you inherit or what your parents own. This is also true in programming. When you create a class that inherits from another class, all the properties of the parent class are passed on to the subclass.

Polymorphism is the choosing the correct code to run depending on the situation. For example, if you have multiple animals that inherit from the class Animals, you may code multiple move options that change depending on which animal. For example, dog.AnimalMove() would run code to walk, and fish.AnimalMove() would run code to swim even though they are both using AnimalMove()

## Part 2: Reusing Components

1. Read the statement/s carefully and indicate **True** or **False**.

|  |  |
| --- | --- |
| Statement | True or False |
| Reusing components and libraries increases costs. | False |

1. Does reusing components and libraries make writing your game easier, and why?

Yes

1. What are the major limitations and costs of Unity’s license?

Free until you make lots of money

1. What are the major architectural differences between Unity3D and another commonly used game engine such as Unreal Engine?

[Answer here]

1. Find and explain how five common programming principles and/or techniques that you can use to improve your code.

|  |  |
| --- | --- |
| Programming principles | Improvement |
| Inheritance |  |
| Polymorphism |  |
|  |  |
|  |  |
|  |  |

1. Match the following standards with their description.

| Standards | Answer | Description |
| --- | --- | --- |
| Ethical AI Principles | C | 1. Responsible for classifying films, television programs, and video games that are released in Australia. Considers the ethical implications of game content when making classification decisions. |
| Australian Classification Board | A | 1. Game developers should also consider platform-specific standards when using AI in their games. For example, Apple requires that apps that use AI should provide clear disclosures, have a privacy policy, and obtain user consent. |
| IGDA Developer Code of Ethics | D | 1. Developers should consider the ethical implications of AI use in gaming and ensure that AI is used in a way that is consistent with ethical principles, such as fairness, transparency, and accountability. |
| Platform-specific standards | B | 1. Sets out principles and standards for ethical game development, covering topics such as intellectual property, diversity and inclusion, and player safety and well-being. |

1. In relation to programming, describe what an algorithm is, and how do you use algorithms when making games?

[Answer here]

## Part 3: Artificial Intelligence

1. List at least 4 path-finding algorithms

| Path-finding algorithms |
| --- |
| A\* |
| IDA\* |
| Greedy |
| Dijkstra |

1. How do path-finding algorithms such a A\* limit games created with them

Limit on path size

1. List and describe 5 major AI terms used within the games industry.

| AI terminology | Description |
| --- | --- |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

1. Imagine you are in a AAA company creating a real-time **strategy (RTS) game (E.g., StarCraft). In this game the player must build an army to** protect a power generator. To train the army the player must gather resources from strategic locations.

Describe the design of an appropriate AI that the player will play against. Detail how the AI will react to different player actions and complete objectives in the game-play scenario.

Details of AI for RTS – What it needs to do

1. Detail the reasoning behind why you chose to design the AI this way and why you believe it is the best AI implementation for this game.

[Answer here]

1. How do the strategies you have detailed effect the budget and timeline. Is the design technically feasible and suitable for players.

[Answer here]

### Student assessment declaration

This assessment is my original work and has not been:

* copied from any source without proper referencing
* written for me by any other person except where such collaboration has been approved by a teacher or assessor.

Student signature and date

### Reasonable adjustment

Reasonable adjustment was in place for this assessment event.

If so, please provide details of any reasonable adjustment strategies that were implemented:

[Insert reasonable adjustment strategies]

### Assessment outcome

Satisfactory  Unsatisfactory

Comments

[Insert comments]

Assessor name, signature and date

Student acknowledgement of assessment outcome

[Would you like to make any comments about this assessment?]

Student name, signature and date