

# CS2011 Intermediate Programming and Problem Solving I - Assessment Overview

**Lecturer and Module Coordinator:** Dr. Laura Maye

**Credit Weighting:** 5

**Semester(s):** Semester 1.

## Overview of Module:

Module Objective: Follow on from module to CS1022, focusing on object-oriented programming (OOP) concepts and library usage, the designing and implementing of computer programs of increasing complexity and sophistication.

Module Content:

- \* generators;
- \* inheritance;
- \* object-oriented design;
- \* polymorphism;
- \* review of classes and objects;
- \* use of language libraries for tasks such as graphical user interfaces, operating system interaction, event-driven programming, regular expressions.

## Overview of CS2011 Project: Building a Bot Trivia Question and Answer Game!

This will be an individual project assignment, which will be developed in stages over the coming semester.

During the semester, you will be building a “*Bot Trivia Question and Answer Game*” through Object Oriented Programming in Python. Further instructions on what is to be achieved will be provided later, but this is the basic premise:

- A bot will act as the Trivia host, the Bot is given an initial series of questions with possible answers
- One by one, the bot will display the questions to the user
- Using input from the keyboard, a user then guesses what they think is the correct answer to the question provided by the Bot.
  - If the user gets the question right, then the Bot will congratulate the user and move to the next question.
  - If the user gets the question wrong, then the Bot will provide an appropriate message and move to the next question.
- The above steps repeat until there are no more questions to go through.

This project will be designed incrementally as the module unfolds, with specific instructions for the assignments provided on the dates shown in the table below.

See the overview on page 2 to view when each of these assessments are due<sup>1</sup>. Note that further details about each assignment, alongside their grading criteria, are yet to be provided.

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<sup>1</sup> Note that to the best extent possible, these times will be met. Any changes to the following will be communicated via Canvas.

ASSIGNMENT	WHEN ASSIGNED?	DUE	Weight
<b>Project Part 1: Using OOP principles to design a QuestionBot Class</b> Demonstrate your ability to employ OOP principles in python. Will be used toward creating the “Bot Trivia Question and Answer Game”. Submission type: python code in a zipped folder, commented on canvas	WEEK 3	Friday 22 <sup>nd</sup> October, 5:00 pm (Week 6)	20 %
<b>Project Part 2: Using OOP principles to design a classes to read questions from a file</b> Demonstrate your ability to apply more advanced OOP principles. Will be used toward creating the “Bot Trivia Question and Answer Game”.  Submission type: python code in a zipped folder, commented.	WEEK 5	Friday 5 <sup>th</sup> November, 5:00 pm (Week 8)	20%
<b>Project Part 3: Revisiting the QuestionBot Class</b> This submission will involve tweaking the assignment from Project Part 1 to implement more advanced OOP principles. Submission type: python code in a zipped folder, commented.	WEEK 7	Friday 19 <sup>th</sup> November, 5:00pm (Week 10)	10%
<b>Final Project: Finalising the Bot Trivia Question and Answer Game + 2 creative features.</b> This submission will involve combining Projects part 1-3 and using a library to display GUI features. You will also demonstrate your ability to creatively problem solve and self learn, through adding 2 features to the project under certain criteria (to be defined later).  Submission type: Python code in a zipped folder, commented Report (max 3 pages)	WEEK 9	Friday 3 <sup>rd</sup> December, 5:00 pm (Week 12)	50 %
<b>Total</b>			<b>100%</b>

### Repeat assessment (100%)

The assessment for this module is 100% Continuous assessment (CA) that builds toward a final project. Passing this module requires students to receive 40/100 of the *combined* project mark.

Note that students taking Autumn supplementals as a repeat or resit will be asked to complete a single assessment corresponding to all CA components combined.

### Project Part 1: Using OOP principles to design a QuestionBot Class for the Bot Trivia Question and Answer Game

Submission format: zipped folder including python files, commented.

Due: **Friday 22<sup>nd</sup> October, 5:00 pm (Week 6)**

In this assignment, students will use object oriented programming to design a class for a QuestionBot, who will display questions and possible answers to a user. Additionally, students will make use of this class to create a basic question and answer style game. Further details on this assignment will be provided in Week 3.

The below table emphasises which of the following learning outcomes will be met with this assignment (next page):

Learning Outcome	How applied?
* Express the principles of object-oriented design;	In this assignment, students will program an interactive question and answer style game using object oriented programming. They will create a class for a Bot, designed to display questions, respond to user interactions, and call methods to simulate responses to user interaction. This assignment will demonstrate the student's ability to apply a single class, create a class instance, distinguish between class attributes and behaviours, and build code that interacts with that class. Code comments will be applied to demonstrate student understanding of the code applied.
* Demonstrate significant improvement in their programming skills	Students will apply, for the first time, object oriented design to their code solutions. In this way, they will demonstrate that they have significantly improved their skills beyond procedural programming approaches, introduced in CS1023.

## Project Part 2: Using OOP principles to design a classes to read questions from a file for the Trivia Question and Answer Game

Submission format: zipped folder including python files, commented.

**Due: Friday 5<sup>th</sup> November, 5:00 pm (Week 8)**

In this part of the project, the students will demonstrate their ability to apply more advanced OOP principles. Through doing so, students will create and use two classes designed to read questions and answers for potential questions in the Trivia Question and Answer Game, and present this content in a dictionary format. Further information on this assignment will be provided in Week 5.

Learning Outcome	How applied?
* Express the principles of object-oriented design	In this assignment, students will be applying a concept called inheritance to create a Parent and Child class. The Parent and Child class interactions are intended to read content from a file and perform specific actions. Here, students will demonstrate their ability to call parent methods from within a child class and call a parent class' constructor from a child class.

	The student will also demonstrate their understanding of this application through code comments.
* Demonstrate significant improvement in their programming skills	Students will apply, for the first time, inheritance into their object oriented design to their code solutions. In this way, they will demonstrate that they have significantly improved beyond single class creation.

### Project Part 3: Revisiting the QuestionBot Class

Submission format: zipped folder including python files, commented.

Due: **Friday 19<sup>th</sup> November, 5:00pm (Week 10)**

In this part of the project, the students will revisit their solution to assignment 1 to implement more advanced object oriented programming concepts. Students will demonstrate that they can create a class that extends the functionality of another class. Further details on this assignment will be provided in week 7.

Learning Outcome	How applied?
* Express the principles of object-oriented design	<p>In this assignment, students will be applying inheritance to create a Parent and Child class, intended to create a class for a general bot and a separate class for the guessing bot.</p> <p>The student will also demonstrate their ability to apply a form of polymorphism – through using method overriding. Additionally, this assignment's criteria also asks for the student to make use of parent methods in the child class in cases of method overriding.</p>
* Demonstrate significant improvement in their programming skills	Students will apply, for the first time, method overriding into their object oriented design to their code solutions. In this way, they will demonstrate that they have significantly improved their ability to apply inheritance into their coding ability.

### Final Project: Finalising the Bot Trivia Question and Answer Game + 2 creative features.

Submission type:

- Python code in a zipped folder, commented
- Report (max 3 pages)

Due: **Friday 3<sup>rd</sup> December, 5:00 pm (Week 12)**

In the final assignment, students will combine their efforts in formulating a fully functioning “**Bot Trivia Question and Answer Game**”. Additionally, students will apply 2 additional features, which will demonstrate their ability to:

- combine the code created in assignments 1-3;
- create a simple interface for the application using language libraries;
- self learn and creatively problem solve using object oriented programming principles.

The below table emphasises which of the following learning outcomes will be met with this assignment:

Learning Outcome	How applied?
* Express the principles of object-oriented design	<p>In this assignment, students will apply inheritance and polymorphism in the design of a Bot Trivia Question and Answer Game.</p> <p>They will also learn the principles of object interaction, whereby one object interacts with another object in some way in the code.</p> <p>They will also demonstrate the lessons in object oriented design and programming from prior assignments for the final project.</p> <p>Additionally, students will be asked to apply two creative features that demonstrate their ability to think about how to apply OOP creatively.</p>
* Demonstrate effective use of language libraries	<p>Students will learn how to make use of language libraries for event driven and graphical user interface applications. Particularly, they will implement pygame for some GUI features. Other commonly used libraries, such as math and os will be used.</p>
* Demonstrate significant improvement in their programming skills	<p>Students will learn how to connect objects together, and particularly, control interaction between two or more objects in their code. They will also demonstrate their ability to creatively problem solve, by conceptualizing and implementing OOP methods and interactions that they have derived.</p>