



OLLSCOIL NA GAILLIMHÉ  
UNIVERSITY OF GALWAY

**2023-2024 Semester 1**

**CT326 Programming III**

## Individual Assignment 3

<b>Objective</b>	Demonstrate serialization and de-serialization of objects, including custom serialization.
<b>Lecturer</b>	Dr Adrian Clear      Email: <a href="mailto:adrian.clear@universityofgalway.ie">adrian.clear@universityofgalway.ie</a>
<b>Marks Awarded</b>	This assignment is marked out of <b>60 marks</b> and is worth ~6% of the overall grade for the module.
<b>Submission</b>	The deadline for submission is <b>23:59 on Wednesday, October 18<sup>th</sup>, 2023.</b>  Your attempt should be submitted through Canvas.  Please provide a <b>single zip file</b> of your answers. See further details below.

## Please complete all parts:

1. Write a serializable Java class called `Player` that has the following class attributes:

```
String id, String username, Country country, LocalDate joinDate,  
List<Achievement> achievements (list of Achievement objects)
```

2. The `Achievement` class should have the following class attributes:

```
String achievementName, String description,  
LocalDate dateOfAward
```

3. Use a test-driven development approach to implement the serialisation of `Player` objects. Write a unit test that creates a list of five `Player` objects, each `Player` object should be also populated with a list of `Achievement` objects. The program should then write out the list of `Player` objects, using Object Serialisation, to a file called "players.ser".

To test the serialisation functionality, you'll need to deserialise the written objects and compare them to the ones that you previously serialised. To do this, in your unit test, load up the `Player` objects from the file using Object Serialisation and compare the `Player` objects that you serialised with those that you deserialised, appropriately.

### Notes:

- The `Player` class should use custom serialisation so that it writes out all attributes, except the list of achievements, to the `ObjectOutputStream` passed to the `writeObject()` method. The list of achievements should instead be written, in text format, to a CSV (Comma Separated Values) file called `achievements.csv` by the `writeObject()` method. Each `Achievement` object in the list of awards should be written as a separate line in the CSV file and each line should contain the attributes of the `Achievement` object separated by a comma, and some way to identify which player the achievement belongs to e.g., you could use the player id for this purpose.
- The `Player` class should implement a `readObject()` method that complements the `writeObject()` method to read all attributes, except the list of achievements, from the `ObjectInputStream` passed to the `readObject()` method. The list of achievements should instead be read, in text format, from the CSV (Comma Separated Values) file previously created by the `writeObject()` method. You can use a `Scanner` to read the different parts of each line using `'` as the delimiter.
- Include appropriate exception handling as required.
- You should fully document your code with Javadoc comments.

### Submission instructions:

Include your name and student number in a comment in each java source file, and explain your code with comments. Submit your work in a single zip file using the name format **assignment3\_firstname\_lastname.zip** via Blackboard - other file formats will NOT be accepted and email submission will NOT be accepted. Include a screen shot of the testing / results in the

same zip file. Use proper indentation in your source code. If you submit more than one attempt then only the last attempt will be marked.

**Plagiarism will be awarded a grade of zero!**