

**SCHOOL OF COMPUTER SCIENCE
COURSEWORK ASSESSMENT PROFORMA**

MODULE & LECTURER: DR MATT MORGAN

DATE SET: MONDAY 20TH FEBRUARY 2017 @ 9AM

SUBMISSION DATE: FRIDAY 3RD MARCH 2017 @ 5PM

SUBMISSION ARRANGEMENTS: SEE BELOW

TITLE: CM1209 JAVA ASSESSMENT 2

This coursework is worth 25% of the total marks available for this module. The penalty for late or non-submission is an award of zero marks. You are reminded of the need to comply with Cardiff University's Student Guide to Academic Integrity. Your work should be submitted using the official Coursework Submission Cover sheet.

SUBMISSION INSTRUCTIONS

1. Your assessment should be uploaded to Learning Central ("Coursework" → "Java Assessment 2") in a single zip archive.
2. In each uploaded source file, you must include your name and student number in the comments at the start of every Java file.
3. Note that by uploading an attempt to Learning Central you are agreeing to comply with the University's Unfair Practice policies. Recall that this is an individual assessment.

You must zip your source files together into **ONE** zip archive. The zip file should be **NAMED** with your **STUDENT NUMBER**; for example, if your student number is c126548, you should upload a zip file named c126548.zip. This zip archive should contain the following files:

Description		Type	Name
Cover sheet	Compulsory	One PDF (.pdf) file	[student number].pdf
Q1	Compulsory	Modified version of the Animal.java	Animal.java
	Compulsory	Modified version of the Zoo.java	Zoo.java
Q2	Compulsory	One PDF (.pdf) file	Q2_[student number].pdf

CRITERIA FOR ASSESSMENT

Credit will be awarded against the following criteria.

QUESTION 1

Your submission will be run against the Assessment2UnitTests.java unit test file. The marks that will be awarded for each individual unit test are shown above the comments of each test within that file. The maximum marks obtainable for this question are 10.

QUESTION 2

Marks will be awarded based upon your understanding of the OOP features of Java and specifically your application of these to achieve a better design. The maximum marks obtainable for this question are 10.

Feedback on your performance will address each of these criteria.

FURTHER DETAILS

Feedback on your coursework will address the above criteria and will be returned in approximately:

15 working days

This will be supplemented with oral feedback via....

Wednesday/Friday laboratory sessions on 8th/10th March 2017.

QUESTION 1

Source files

Source files to begin the assessment are provided on Learning Central. They can be found at “Coursework” → “CM1209 ASSESSMENT 2”), in a file called **cw2_source_files.zip**. It contains the following files:

- **Animal.java**: One of two template files you must modify and upload to Learning Central to complete question 1 of this assessment.
- **Zoo.java**: The second of two template files you must modify and upload to Learning Central to complete question 1 of this assessment.
- **Ast2ut.zip**: A zip archive containing **Assessment2UnitTests.java**: The unit tests that will be used to evaluate your submission. This file is provided for your reference; it does not need to be modified and should **not** be uploaded to Learning Central as part of your final submission. You should check this file to determine how many marks each unit test contributes to the overall mark for this assignment. See the sections ***How to read the unit tests source file*** and ***Running the Unit Test File*** below for more information.

Part 1

Download the file `Animal.java`. The `Animal` class represents one or more animal instances. Complete the methods as indicated by the comments. To support the functionality, you will also need to define appropriate instance variables in the class.

Several methods are expected to perform error checking and input validation. To report an erroneous condition in a method you should use the `throw` keyword. For example, the following line would throw an `IllegalStateException`:

```
if (expression) {  
    throw new IllegalStateException("Error information");  
}
```

Part 2

Download the file `Zoo.java`. The `Zoo` class represents a collection of `Animals`. The class initially only contains template constructor methods. You should complete these constructors and then add the following methods:

Name	Return type	Parameters
<code>addAnimal</code>	<code>None</code>	<code>Animal newAnimal</code>
Add an animal to the Zoo. The method should check whether the zoo has capacity for the animal before		

adding it. If adding an animal with many instances would bring the zoo over capacity, then the method should throw an <code>IllegalStateException</code> with an appropriate error message.		
<code>hasAnimalWithName</code>	<code>boolean</code>	<code>String animalName</code>
Returns true if this zoo contains an animal with a given name. The animal should be matched to the given name in a case insensitive manner; i.e., if this zoo has an animal name 'Tiger' then <code>hasAnimalWithName("tiGeR")</code> should return true.		
<code>getAnimalWithName</code>	<code>Animal</code>	<code>String animalName</code>
Returns the animal in the zoo with the given name. As with <code>hasAnimalWithName</code> , matching should be case insensitive. If the animal does not exist in the zoo, this method will return the null reference.		
<code>numberAvailableAnimals</code>	<code>int</code>	<code>None</code>
Get the total number of animal in the zoo that are not on loan to other zoo collections.		

How to read the unit tests source file

Each method in the unit test source file represents one unit test. An example unit test is:

```
// marks=2.0
@Test ( timeout=4000,
expected=IllegalArgumentException.class )
public void q0testX() {
    ...
}
```

The line `// marks=2.0` indicates that passing this unit test provides 2 marks. The expression `expected=IllegalArgumentException.class` on line:

```
@Test ( timeout=4000, expected=IllegalArgumentException.class )
```

indicates that the unit test expects an `IllegalStateException` to be thrown by the method(s) being tested. If the required exception is not thrown the test does not pass. Tests omitting the `expected=...` expression do not require an exception to be thrown.

Running the Unit Test File

Instructions on how to run the unit test file `Assessment2UnitTests.java` are provided with the `ast2ut.zip` archive, in the source files provided.

NOTE: If you are having any difficulties running the unit tests, once the instructions have been released, you can also bring your source files to the following laboratory sessions:

Wednesday 1st March 2017 @ 09:00 or Friday 3rd March 2017 @ 09:00

QUESTION 2

Write a PDF report that details how the Zoo and Animal classes could be redesigned to take advantage of the Object Oriented Paradigms available in Java. The focus of your design should be to promote code reuse and to separate the interface/implementation to allow programmers that use your classes, to program at the interface level.

NOTE: You are NOT required to provide an implementation, only a design. The choice of how you present that design, is up to you (Examples include: a written outline of what you would do, a UML class diagram, etc...).