FACULTY OF ENGINEERING AND INFORMATION SCIENCES

SUBJECT'S INFORMATION:			
Subject:	CSCI251 Advanced Programming		
Session:	Spring 2019 (July)		
Programme / Section:	Computer Science		
Lecturer:	Ms. Siti Hawa		
Coursework Type *(tick appropriate box)*	❑ Individual Assignment ❑ Group Assignment ❑ Project ✓ Lab Task ❑ Seminar / Tutorial Paper ❑ Others		
Coursework Title:	**Lab Task 10**	Coursework Percentage:	1%

ASSESSMENT CRITERIA:

All programs should produce the correct result as stated in the specification. Programs should be written only using the programming structures and concepts already covered during lectures. Meaningful identifiers used. Proper indentation and line spacing. Suitable comments are recommended. Output should be well formatted with appropriate messages displayed. Numbers are shown with appropriate precision. Programs with syntax error and are unable to execute will not be awarded any mark.

SUBMISSION:

All completed work should be submitted online through Moodle before the due date provided.

SUBMIT AS EARLY AS POSSIBLE. ONLY ONE SUBMISSION IS ALLOWED. IF RE-SUBMISSION IS NECESSARY, YOU ARE REQUIRED TO REMOVE THE EARLIER SUBMISSION AND THIS MUST BE DONE BEFORE THE DUE DATE. OTHERWISE YOU WILL BE PENALIZED FOR LATE SUBMISSON.

DUE DATE:	**WEEK 16**

PENALTIES FOR LATE SUBMISSION:

Penalties apply to all late work, except if student academic consideration has been granted. Late submissions will attract a penalty of 25% of the assessment mark per day including the weekend. Work more than (3) days late will be awarded a mark of zero.

PLAGIARISM:

When you submit an assessment task, you are declaring the following

1. It is your own work and you did not collaborate with or copy from others.
2. You have read and understand your responsibilities under the University of Wollongong's policy on plagiarism.
3. You have not plagiarised from published work (including the internet). Where you have used the work from others, you have referenced it in the text and provided a reference list at the end ot the assignment.

Plagiarism will not be tolerated. Students are responsible for submitting original work for assessment, without plagiarising or cheating, abiding by the University's policies on Plagiarism as set out in the University Handbook under University Policy Directory and in Faculty handbooks and subject guides.

COURSEWORK SPECIFICATION

OBJECTIVES:

Following completion of this task, students should be able to:

- Write C++ programs using class templates and STL Sequence Containers.

Question 1 (Class Template)

Create a class template called ObjectContainer that holds an object and the number of data elements in the object. For example, if an Employee class has two data elements, an ID number and a salary, then the class template holds the number 2 and an Employee object; if a Student class contains 12 data elements, then the class template holds 12 and a Student object.

Write an overloaded extraction (>>) operator for the ObjectContainer class template that displays a message on the screen – "You will be ask to enter X items" – where X is the number of data elements and then continue to read the details for the object it is holding. To do this, the class which object is kept in the class template must also overload the extraction operator (>>). Implement also the insertion operator (<<) for all the classes involved.

Write a main() function that tests your template class with objects from two different classes of your choice.

Question 2 (STL – Sequence Containers)

A palindrome is a sequence of characters, numbers or words that have the property of reading the same in either direction (backwards or forwards). In a palindrome white space and punctuation have no significance (they are typically ignored).

Examples of palindromes are shown below:

121 - A numeric sequence

GACTTCAG - A DNA Sequence

Sator Arepo tenet opera rotas - A latin phrase for: *The farmer by his labour keeps the wheels to the plough.*

As you can see in the last example, white space and capitalisations are ignored. You are to write a program that takes in a sequence and works out if it is/isn't a palindrome.

Write a C++ program that reads a string/sequence from standard input until eof. The string/sequence, including all white space, punctuation and newline characters should be read in character-by-character and stored into a vector. The vector should hold objects of type char. When the sequence is finished being read in, create two iterators. One iterator points to the beginning and the other the end of the vector.

By using these iterators you can work out if the sequence is the same in both forward and reverse directions. Remember that you should ignore case, punctuation and white space characters. If the sequence is a palindrome,

you should print it out in both forward and reverse directions and indicate it is a palindrome. Otherwise display an error message.
