

**INTI**LAUREATE INTERNATIONAL UNIVERSITIES[®]UNIVERSITY OF
WOLLONGONG
AUSTRALIA

Faculty of Engineering and Information Sciences

COURSEWORK COVERSHEET

SUBJECT'S INFORMATION:			
Subject:	CSCI203 ALGORITHMS AND DATA STRUCTURES		
Session:	AUTUMN 2016		
Programme / Section:	BCS/MG1,S1,D1,MC1		
Lecturer:	Ms PAWANI		
Coursework Type <i>(tick appropriate box)</i>	<input checked="" type="checkbox"/> Individual Assignment <input type="checkbox"/> Lab Exercise / Journal	<input type="checkbox"/> Group Assignment <input type="checkbox"/> Seminar / Tutorial Paper	<input type="checkbox"/> Project <input type="checkbox"/> Others
Coursework Title:	ASSIGNMENT 3	Coursework Percentage:	10%
Hand-out Date:	Week 12	Received By :	
Due Date:	Week 13	Received Date :	
STUDENT'S INFORMATION:			
Student's Name & ID:			
Contact Number / Email:			
STUDENT'S DECLARATION			
By signing this, I / We declare that: 1. This assignment meets all the requirements for the subject as detailed in the relevant Subject Outline, which I/ we have read. 2. It is my / our own work and I / we did not collaborate with or copy from others. 3. I / we have read and understand my responsibilities under the University of Wollongong's policy on plagiarism. 4. I / we have not plagiarised from published work (including the internet). Where I have used the work from others, I / we have referenced it in the text and provided a reference list at the end of the assignment. I am / we are aware that late submission without an authorised extension from the subject co-ordinator may incur a penalty. <i>(See your subject outline for further information).</i>			
Name & Signature:			

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COURSEWORK SUBMISSION RECEIPT			
Subject:		Session:	
Programme / Section:		Lecturer:	
Coursework Type: <i>(Tick appropriate box)</i>	<input type="checkbox"/> Individual Assignment <input type="checkbox"/> Lab Exercise / Journal	<input type="checkbox"/> Group Assignment <input type="checkbox"/> Seminar / Tutorial Paper	<input type="checkbox"/> Project <input type="checkbox"/> Others
Coursework Title:		Coursework Percentage:	
Hand-out Date:		Received By: <i>(Signature)</i>	
Due date:		Received Date:	
STUDENT'S INFORMATION:			
Student's Name & ID:			
Contact Number /			

Assessment Criteria	Total Marks	Given Marks
Correctness	4	
Efficiency	2	
Validation	2	
Output presentation	2	
	10	
	Penalty	
Marked by: _____ Date: _____	Final Mark (%)	
Lecturer's Comments		
Penalty for late submission:		
1 day – minus 20% of total mark awarded 2 days – minus 50% of total mark awarded 3 days – 0 mark for this piece of coursework		

CSCI203 Algorithms and Data Structures

Assignment 3

Autumn Session 2016

Objectives

- To apply greedy algorithm concepts.
- To be able to represent a minimum spanning tree diagrammatically.
- To write the program to represent a prim's minimum spanning tree.

Problem

Prim's algorithm is a greedy algorithm that finds a minimum spanning tree of a connected, weighted graph $G(E,N)$ by progressively add an edge of minimum weight that has one vertex in the current tree and the other not in the current tree.

Info of a graph is given as below.

```
6
1 2 4
1 3 2
1 5 3
2 4 5
3 4 1
3 5 6
3 6 3
4 6 6
5 6 2
0 0 0
```

The first row shows an integer, being the number of nodes in the graph.

The remaining rows show a sequence of sets of three integers, where the first two are node numbers and the third number is a cost.

Input of edges is terminated by the sequence 0 0 0.

Note: the graph is undirected so an edge from i to j is also an edge from j to i .

Write a program to represent the standard Prim's algorithm for the above graph. You can start from the node 1.

Output should be:

The set of edges in the minimal spanning tree

The total length of the tree

Do include some analysis regarding the violated properties