



## **CZ2002 Object Oriented Design & Programming**

Group Project

Lab Group SS4 Group 2

Prepared by:

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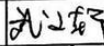




Lance Gabriel U1720635K

### Declaration of Original Work for CZ2002 Assignment

We hereby declare that the attached group assignment has been researched, undertaken, completed and submitted as a collective effort by the group members listed below.

We have honored the principles of academic integrity and have upheld Student Code of Academic Conduct in the completion of this work.

We understand that if plagiarism is found in the assignment, then lower marks or no marks will be awarded for the assessed work. In addition, disciplinary actions may be taken.

Name	Course (CE2002 or CZ2002)	Lab Group	Signature/Date
WU WENXUAN	CZ2002	SS4	 16/11/18
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## 1. Design Considerations

With the Single Responsibility Principle (SRP) in mind, our group has defined our classes to include attributes and methods that are directly related to the classes themselves. In doing so, we ensure that each class only assumes a single responsibility and there will not be more than one reason for any class to change. Furthermore, we noticed that some of our classes contribute to realizing the same underlying requirement. For example, both lecture and tutorial classes deal with course components. Consequently, we have opted to group such classes under the same package for organization and communication purposes.

Except for the *SCRAM* class, every class deals with changes pertaining to their own class and can therefore be represented as ‘entities’. The *SCRAM* class however, acts as a ‘control’ as it is responsible for calling the methods of other classes to coordinate and realize use cases. It also acts as the ‘boundary’ since it is through this class that the user interacts with the application.

At the highest level of abstraction, all classes implement the ‘serializable’ interface. After serialization, the entire state of the application is saved into a binary file and can be deserialized during the next execution of the program. This allows users to avoid entering past data into the application every time the application is restarted.

Our design illustrates various relationships among entities, as described by the following examples. The Subcomponent and MainComponent concrete classes are a *realization* of the Examinable interface. This implementation is aligned with the Open-Closed Principle (OCP), where the Examinable class is open for extension (other types of components can be added in the future) but closed for modification (interface details need not be changed). Observe that at this stage, we have included both the Serializable and Examinable interfaces in our design. Having two different interfaces support the Interface Segregation Principle (ISP) since not every class is required to implement the Examinable interface, while every class must implement the Serializable interface for the entire application to be saved.

The CourseComponent superclass is a *generalization* of the Laboratory, Lecture and Tutorial subclasses. This supports the Liskov Substitution Principle (LSP), as the user of the CourseComponent superclass can continue to function properly if either of its subclasses are passed to the user. This is due to the design by contract where the preconditions of the subclasses are no stronger than that of the superclass, and the post-conditions of the subclasses are no weaker than that of the superclass. Furthermore, this relationship

demonstrates the Dependency Injection Principle (DIP) since the superclass need not depend on the details of its subclasses.

Each MainComponent is a *composition* of different Subcomponents. While the relationships described thus far can be classified as *association* relationships, we have *dependency* relationships as well. An example of this is from Student to Result, and this is due to the getResultForCourse() method in the Student class returning an object of Result type.

## 2. Assumptions Made

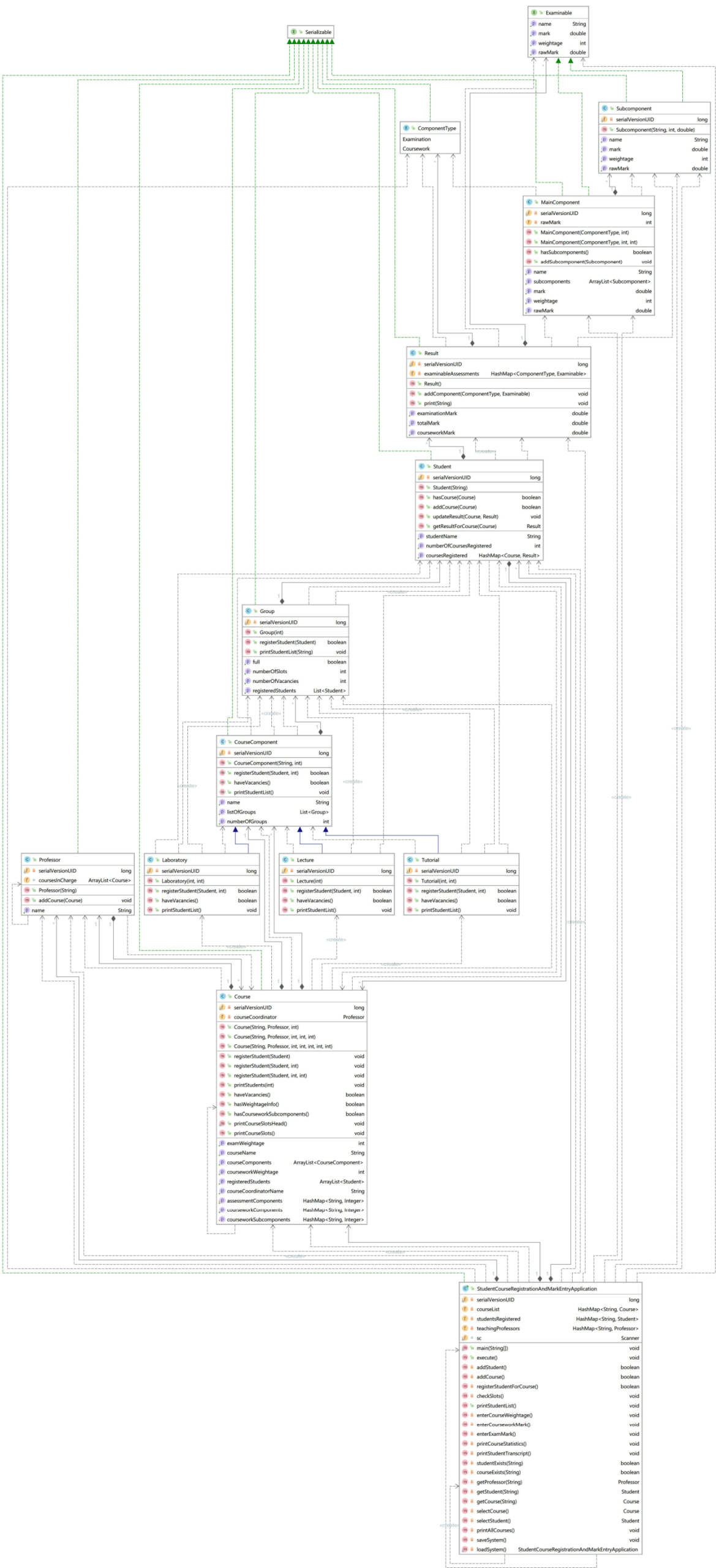
1. Each course will either only have lectures, or both lectures and tutorials or all lectures, tutorials and laboratories. This means that all courses must have lectures. And if a course does not have tutorials, it is impossible that it can have laboratories.
2. Each course has only 1 lecture group. When students register for a course, he/she will be automatically allocated to the only 1 lecture group.
3. Each course has only 1 professor/course coordinator.
4. There is no students/professor that has the same name.
5. There is no restriction to how many courses a student can take/a professor can teach.
6. A course will always have 2 main assessment components, namely Coursework and Examination.
7. The coursework component can have or not have subcomponents. If it has subcomponents, it must have at least 2 subcomponents.
8. Subcomponents cannot have more subcomponents on its own. That is,
9. All the weightages (as of parent component) of assessment components are integer values. For instance, 30%, 35% but not 35.5%. Although weightages can be double data type as an overall percentage. (e.g. 12.5%).
10. The coursework/examination marks are only entered once, that is at the end of each semester.

## 3. Documentation of Java API

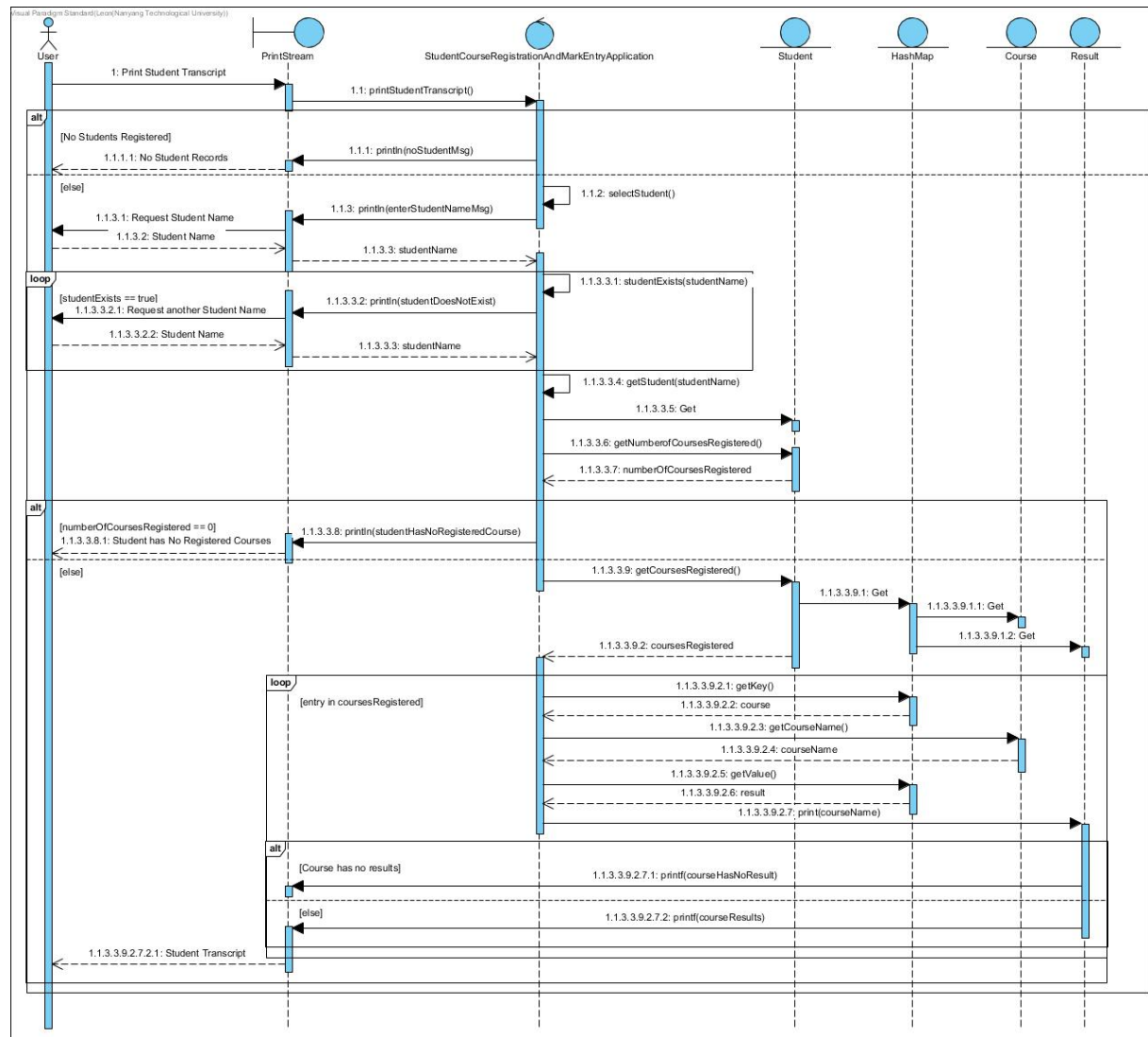
The documentation of the Java API can be found in the index.html under the /docs folder.

Alternatively, it can be viewed online at <https://l0rem1psum.github.io/SCRAME>

4. UML Class Diagram



## 5. UML Sequence Diagram of “Print Student Transcript”



## 6. Test Cases and Results

### SRAME Menu options

Student Course Registration And Mark Entry Application (SCRAM) Menu			
1	Add a student	6	Enter course assessment components weightage
2	Add a course	7	Enter coursework mark
3	Register Student for a course	8	Enter exam mark
4	Check available slots in a class	9	Print course statistics
5	Print student list	10	Print student transcript
(0): Save the system (-1): Exit			

Please enter your option:

### 1. Add a student

Test Case	Expected Outcome																
a Add a new student	Please enter your option: 1 What is the name of the student? A_For_OODP <table><tr><td>Student Name</td></tr><tr><td>Bruce Lee</td></tr><tr><td>Romeo Tan</td></tr><tr><td>Zoe Tay</td></tr><tr><td>Felicia Chin</td></tr><tr><td>Vivien Lai</td></tr><tr><td>Aloysius Pang</td></tr><tr><td>Michelle Chong</td></tr><tr><td>Andy Lau</td></tr><tr><td>Ian Fang</td></tr><tr><td>Carrie Wong</td></tr><tr><td>Shaun Chen</td></tr><tr><td>Rebecca Lim</td></tr><tr><td>Jay Chou</td></tr><tr><td>A_For_OODP</td></tr><tr><td>Ben Yeo</td></tr></table>	Student Name	Bruce Lee	Romeo Tan	Zoe Tay	Felicia Chin	Vivien Lai	Aloysius Pang	Michelle Chong	Andy Lau	Ian Fang	Carrie Wong	Shaun Chen	Rebecca Lim	Jay Chou	A_For_OODP	Ben Yeo
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Jay Chou																	
A_For_OODP																	
Ben Yeo																	
b Add an existing student	Please enter your option: 1 What is the name of the student? A_For_OODP This student has already been added!																
c Invalid data entries	Please enter your option: 1 What is the name of the student? 31811413 Please enter a valid name! Enter again please: dnjeaknfmf9 Please enter a valid name! Enter again please: kjanflf alidaem8 Please enter a valid name! Enter again please:																



## 2. Add a course

	Test Case	Expected Outcome																		
a	Add a new course (with combination of (ii) from above)	Please enter your option: 2 What is the name of the course? CZ1012 What is the name of the Professor? James Tan How many vacancies are there for a lecture? 5 Does this course have tutorials? (Type Y for yes, or any other character for no.) y How many tutorial groups does this course have? 2 How many vacancies are there in one tutorial group? 10 Does this course have labs? (Type Y for yes, or any other character for no.) y How many lab groups does this course have? 2 How many vacancies are there in one lab group? 10 <table><tr><td colspan="2">+-----+-----+</td></tr><tr><td>  Course Name  </td><td>  Course Coordinator  </td></tr><tr><td colspan="2">+-----+-----+</td></tr><tr><td>  AB1601  </td><td>  Koh Cheng Boon  </td></tr><tr><td>  CZ2003  </td><td>  Alexi Sourin  </td></tr><tr><td>  CZ1012  </td><td>  James Tan  </td></tr><tr><td>  CZ1011  </td><td>  Lana Obratzsova  </td></tr><tr><td>  BC2406  </td><td>  Neumann Chew  </td></tr><tr><td colspan="2">+-----+-----+</td></tr></table>	+-----+-----+		Course Name	Course Coordinator	+-----+-----+		AB1601	Koh Cheng Boon	CZ2003	Alexi Sourin	CZ1012	James Tan	CZ1011	Lana Obratzsova	BC2406	Neumann Chew	+-----+-----+	
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b	Add an existing course	Please enter your option: 2 What is the name of the course? BC2406 This course has already been added! <table><tr><td colspan="2">+-----+-----+</td></tr><tr><td>  Course Name  </td><td>  Course Coordinator  </td></tr><tr><td colspan="2">+-----+-----+</td></tr><tr><td>  AB1601  </td><td>  Koh Cheng Boon  </td></tr><tr><td>  CZ2003  </td><td>  Alexi Sourin  </td></tr><tr><td>  CZ1012  </td><td>  James Tan  </td></tr><tr><td>  CZ1011  </td><td>  Lana Obratzsova  </td></tr><tr><td>  BC2406  </td><td>  Neumann Chew  </td></tr><tr><td colspan="2">+-----+-----+</td></tr></table>	+-----+-----+		Course Name	Course Coordinator	+-----+-----+		AB1601	Koh Cheng Boon	CZ2003	Alexi Sourin	CZ1012	James Tan	CZ1011	Lana Obratzsova	BC2406	Neumann Chew	+-----+-----+	
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c	Invalid data entries	Please enter your option: 2 What is the name of the course? CZ2002 What is the name of the Professor? 370194 Please enter a valid name! Enter again please: anfoaenfm1931 Please enter a valid name! Enter again please: ndajwd wmdaodm29 Please enter a valid name! Enter again please:																		

## 3. Register student for a course

	Test Case	Expected Outcome																																																			
a	Add a student to a course with available vacancies in Tut/ Lab.	<p>Please enter your option: 3 Please enter the name of the student for which you want to register course for: Ben Yeo Please choose the course listed below:</p> <table><tr><td colspan="2">+-----+-----+</td></tr><tr><td>  Course Name  </td><td>  Course Coordinator  </td></tr><tr><td colspan="2">+-----+-----+</td></tr><tr><td>  AB1601</td><td>  Koh Cheng Boon</td></tr><tr><td>  CZ2003</td><td>  Alexi Sourin</td></tr><tr><td>  CZ1012</td><td>  James Tan</td></tr><tr><td>  CZ1011</td><td>  Lana Obratzsova</td></tr><tr><td>  BC2406</td><td>  Neumann Chew</td></tr><tr><td colspan="2">+-----+-----+</td></tr></table> <p>CZ1011 The vacancies information of course CZ1011 is as follows:</p> <table><tr><td colspan="3">+-----+-----+</td></tr><tr><td>  Course Name  </td><td>  Group  </td><td>  Vacancies /Slots  </td></tr><tr><td colspan="3">+-----+-----+</td></tr><tr><td>  CZ1011</td><td>  Lecture</td><td>  5/5  </td></tr><tr><td colspan="3">+-----+-----+</td></tr><tr><td> </td><td>  Tutorial Grp 1  </td><td>  10/10  </td></tr><tr><td> </td><td>  Tutorial Grp 2  </td><td>  10/10  </td></tr><tr><td colspan="3">+-----+-----+</td></tr><tr><td> </td><td>  Lab Grp 1  </td><td>  10/10  </td></tr><tr><td> </td><td>  Lab Grp 2  </td><td>  10/10  </td></tr><tr><td colspan="3">+-----+-----+</td></tr></table> <p>Please enter the tutorial group number that the student wants to register: 1</p>	+-----+-----+		Course Name	Course Coordinator	+-----+-----+		AB1601	Koh Cheng Boon	CZ2003	Alexi Sourin	CZ1012	James Tan	CZ1011	Lana Obratzsova	BC2406	Neumann Chew	+-----+-----+		+-----+-----+			Course Name	Group	Vacancies /Slots	+-----+-----+			CZ1011	Lecture	5/5	+-----+-----+				Tutorial Grp 1	10/10		Tutorial Grp 2	10/10	+-----+-----+				Lab Grp 1	10/10		Lab Grp 2	10/10	+-----+-----+		
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		<div>Please enter the lab group number that the student wants to register: 2 The student Ben Yeo has successfully been registered to the course CZ1011 with tutorial group 1 and The new vacancies information is as follows: <table><tr><th>Course Name</th><th>Group</th><th>Vacancies /Slots</th></tr><tr><td rowspan="5">CZ1011</td><td>Lecture</td><td>4/5</td></tr><tr><td>Tutorial Grp 1</td><td>9/10</td></tr><tr><td>Tutorial Grp 2</td><td>10/10</td></tr><tr><td>Lab Grp 1</td><td>10/10</td></tr><tr><td>Lab Grp 2</td><td>9/10</td></tr></table></div>	Course Name	Group	Vacancies /Slots	CZ1011	Lecture	4/5	Tutorial Grp 1	9/10	Tutorial Grp 2	10/10	Lab Grp 1	10/10	Lab Grp 2	9/10																																																																
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b	<div>(i)Add a student to a course with 0 vacancies in lecture slot. (ii) Add a student to a course with 0 available vacancies in Tut / Lab.</div>	<div><div>Please enter your option: 3 Please enter the name of the student for which you want to register course for: Carrie Wong Please choose the course listed below: <table><tr><th>Course Name</th><th>Course Coordinator</th></tr><tr><td>AB1601</td><td>Koh Cheng Boon</td></tr><tr><td>CZ2003</td><td>Alexi Sourin</td></tr><tr><td>CZ1012</td><td>James Tan</td></tr><tr><td>CZ1011</td><td>Lana Obratzsova</td></tr><tr><td>BC2406</td><td>Neumann Chew</td></tr></table> CZ1011 The vacancies information of course CZ1011 is as follows: <table><tr><th>Course Name</th><th>Group</th><th>Vacancies /Slots</th></tr><tr><td rowspan="5">CZ1011</td><td>Lecture</td><td>0/5</td></tr><tr><td>Tutorial Grp 1</td><td>8/10</td></tr><tr><td>Tutorial Grp 2</td><td>7/10</td></tr><tr><td>Lab Grp 1</td><td>10/10</td></tr><tr><td>Lab Grp 2</td><td>5/10</td></tr></table> (i) Sorry! The course you want to add has no more vacancies! (ii) Please enter your option: 3 Please enter the name of the student for which you want to register course for: Bruce Lee Please choose the course listed below: <table><tr><th>Course Name</th><th>Course Coordinator</th></tr><tr><td>AB1601</td><td>Koh Cheng Boon</td></tr><tr><td>CZ2002</td><td>Zhang Jie</td></tr><tr><td>CZ2003</td><td>Alexi Sourin</td></tr><tr><td>CZ1011</td><td>Lana Obratzsova</td></tr><tr><td>BC2406</td><td>Neumann Chew</td></tr></table> CZ2002 The vacancies information of course CZ2002 is as follows: <table><tr><th>Course Name</th><th>Group</th><th>Vacancies /Slots</th></tr><tr><td rowspan="9">CZ2002</td><td>Lecture</td><td>7/10</td></tr><tr><td>Tutorial Grp 1</td><td>0/3</td></tr><tr><td>Tutorial Grp 2</td><td>3/3</td></tr><tr><td>Tutorial Grp 3</td><td>3/3</td></tr><tr><td>Tutorial Grp 4</td><td>3/3</td></tr><tr><td>Tutorial Grp 5</td><td>3/3</td></tr><tr><td>Lab Grp 1</td><td>0/3</td></tr><tr><td>Lab Grp 2</td><td>3/3</td></tr></table> Please enter the tutorial group number that the student wants to register: 1 The selected tutorial group has no more vacancies. Please choose again! 2 Please enter the lab group number that the student wants to register: 1 The selected lab group has no more vacancies. Please choose again! 2 The student Bruce Lee has successfully been registered to the course CZ2002 with tutorial group 2 and lab group 2. The new vacancies information is as follows: <table><tr><th>Course Name</th><th>Group</th><th>Vacancies /Slots</th></tr><tr><td rowspan="9">CZ2002</td><td>Lecture</td><td>6/10</td></tr><tr><td>Tutorial Grp 1</td><td>0/3</td></tr><tr><td>Tutorial Grp 2</td><td>2/3</td></tr><tr><td>Tutorial Grp 3</td><td>3/3</td></tr><tr><td>Tutorial Grp 4</td><td>3/3</td></tr><tr><td>Tutorial Grp 5</td><td>3/3</td></tr><tr><td>Lab Grp 1</td><td>0/3</td></tr><tr><td>Lab Grp 2</td><td>2/3</td></tr></table></div></div>	Course Name	Course Coordinator	AB1601	Koh Cheng Boon	CZ2003	Alexi Sourin	CZ1012	James Tan	CZ1011	Lana Obratzsova	BC2406	Neumann Chew	Course Name	Group	Vacancies /Slots	CZ1011	Lecture	0/5	Tutorial Grp 1	8/10	Tutorial Grp 2	7/10	Lab Grp 1	10/10	Lab Grp 2	5/10	Course Name	Course Coordinator	AB1601	Koh Cheng Boon	CZ2002	Zhang Jie	CZ2003	Alexi Sourin	CZ1011	Lana Obratzsova	BC2406	Neumann Chew	Course Name	Group	Vacancies /Slots	CZ2002	Lecture	7/10	Tutorial Grp 1	0/3	Tutorial Grp 2	3/3	Tutorial Grp 3	3/3	Tutorial Grp 4	3/3	Tutorial Grp 5	3/3	Lab Grp 1	0/3	Lab Grp 2	3/3	Course Name	Group	Vacancies /Slots	CZ2002	Lecture	6/10	Tutorial Grp 1	0/3	Tutorial Grp 2	2/3	Tutorial Grp 3	3/3	Tutorial Grp 4	3/3	Tutorial Grp 5	3/3	Lab Grp 1	0/3	Lab Grp 2	2/3
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c	Register the same course again.	<p>Please enter your option:</p> <p>3</p> <p>Please enter the name of the student for which you want to register course for:</p> <p>Ben Yeo</p> <p>Please choose the course listed below:</p> <table><tr><td>Course Name</td><td>Course Coordinator</td></tr><tr><td>AB1601</td><td>Koh Cheng Boon</td></tr><tr><td>CZ2003</td><td>Alexi Sourin</td></tr><tr><td>CZ1012</td><td>James Tan</td></tr><tr><td>CZ1011</td><td>Lana Obratzsova</td></tr><tr><td>BC2406</td><td>Neumann Chew</td></tr></table> <p>BC2406</p> <p>Sorry! The student you entered has already registered course BC2406.</p>	Course Name	Course Coordinator	AB1601	Koh Cheng Boon	CZ2003	Alexi Sourin	CZ1012	James Tan	CZ1011	Lana Obratzsova	BC2406	Neumann Chew												
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d	Invalid data entries (eg wrong student ID / course code etc)	<p><b>Wrong student name:</b></p> <p>Please enter your option:</p> <p>3</p> <p>Please enter the name of the student for which you want to register course for:</p> <p>dmelafnaelkfm</p> <p>The student you entered is currently not recorded in the system. Please add the student before registering courses</p> <p><b>Wrong course code:</b></p> <p>Please enter your option:</p> <p>3</p> <p>Please enter the name of the student for which you want to register course for:</p> <p>Ben Yeo</p> <p>Please choose the course listed below:</p> <table><tr><td>Course Name</td><td>Course Coordinator</td></tr><tr><td>AB1601</td><td>Koh Cheng Boon</td></tr><tr><td>CZ2003</td><td>Alexi Sourin</td></tr><tr><td>CZ1012</td><td>James Tan</td></tr><tr><td>CZ1011</td><td>Lana Obratzsova</td></tr><tr><td>BC2406</td><td>Neumann Chew</td></tr></table> <p>dmekalfm</p> <p>Please make sure you only enter the course name that is already registered in the system!</p> <p>Please choose the course listed below:</p> <table><tr><td>Course Name</td><td>Course Coordinator</td></tr><tr><td>AB1601</td><td>Koh Cheng Boon</td></tr><tr><td>CZ2003</td><td>Alexi Sourin</td></tr><tr><td>CZ1012</td><td>James Tan</td></tr><tr><td>CZ1011</td><td>Lana Obratzsova</td></tr><tr><td>BC2406</td><td>Neumann Chew</td></tr></table>	Course Name	Course Coordinator	AB1601	Koh Cheng Boon	CZ2003	Alexi Sourin	CZ1012	James Tan	CZ1011	Lana Obratzsova	BC2406	Neumann Chew	Course Name	Course Coordinator	AB1601	Koh Cheng Boon	CZ2003	Alexi Sourin	CZ1012	James Tan	CZ1011	Lana Obratzsova	BC2406	Neumann Chew
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BC2406	Neumann Chew																									

#### 4. Check available slot in a class (Vacancy in a class)

	Test Case	Expected Outcome																														
a	Check for (i) Tutorial class (ii) Lab class	<p>Please enter your option: 4</p> <p>Please choose the course listed below:</p> <table><tr><th>Course Name</th><th>Course Coordinator</th></tr><tr><td>AB1601</td><td>Koh Cheng Boon</td></tr><tr><td>CZ2002</td><td>Zhang Jie</td></tr><tr><td>CZ2003</td><td>Alexi Sourin</td></tr><tr><td>CZ1011</td><td>Lana Obratzsova</td></tr><tr><td>BC2406</td><td>Neumann Chew</td></tr></table> <p>CZ1011</p> <table><tr><th>Course Name</th><th>Group</th><th>Vacancies /Slots</th></tr><tr><td>CZ1011</td><td>Lecture</td><td>4/5</td></tr><tr><td></td><td>Tutorial Grp 1</td><td>9/10</td></tr><tr><td></td><td>Tutorial Grp 2</td><td>10/10</td></tr><tr><td></td><td>Lab Grp 1</td><td>10/10</td></tr><tr><td></td><td>Lab Grp 2</td><td>9/10</td></tr></table>	Course Name	Course Coordinator	AB1601	Koh Cheng Boon	CZ2002	Zhang Jie	CZ2003	Alexi Sourin	CZ1011	Lana Obratzsova	BC2406	Neumann Chew	Course Name	Group	Vacancies /Slots	CZ1011	Lecture	4/5		Tutorial Grp 1	9/10		Tutorial Grp 2	10/10		Lab Grp 1	10/10		Lab Grp 2	9/10
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	Lab Grp 2	9/10																														

c Invalid data entries(eg course code, class code etc)

Invalid Course Name:  
Please enter your option:  
4  
Please choose the course listed below:

Course Name	Course Coordinator
AB1601	Koh Cheng Boon
CZ2002	Zhang Jie
CZ2003	Alexi Sourin
CZ1011	Lana Obratzsova
BC2406	Neumann Chew

dajkenaflem  
Please make sure you only enter the course name that is already registered in the system!  
Please choose the course listed below:

Course Name	Course Coordinator
AB1601	Koh Cheng Boon
CZ2002	Zhang Jie
CZ2003	Alexi Sourin
CZ1011	Lana Obratzsova
BC2406	Neumann Chew

BC2406

Course Name	Group	Vacancies /Slots
BC2406	Lecture	5/5

## 5. Print Student list by lecture, tutorial or laboratory session for a course.

	Test Case	Expected Outcome																																																				
a	Print list by (i) Lecture (ii) Tutorial group/s (iii) Lab group/s	<p><b>(i)</b></p> <p>Please enter your option: 5</p> <p>Please choose the course listed below:</p> <table><tr><th>Course Name</th><th>Course Coordinator</th></tr><tr><td>AB1601</td><td>Koh Cheng Boon</td></tr><tr><td>CZ2002</td><td>Zhang Jie</td></tr><tr><td>CZ2003</td><td>Alexi Sourin</td></tr><tr><td>CZ1011</td><td>Lana Obratzsova</td></tr><tr><td>BC2406</td><td>Neumann Chew</td></tr></table> <p>CZ2002</p> <p>Do you want to?</p> <table><tr><td>1</td><td>Print students by lecture</td></tr><tr><td>2</td><td>Print students by tutorial groups</td></tr><tr><td>3</td><td>print students by lab groups</td></tr></table> <p>1</p> <table><tr><th>Group</th><th>Name</th></tr><tr><td>Lecture</td><td>Ben Yeo Andy Lau Carrie Wong Bruce Lee</td></tr></table> <p><b>(ii)</b></p> <p>Please enter your option: 5</p> <p>Please choose the course listed below:</p> <table><tr><th>Course Name</th><th>Course Coordinator</th></tr><tr><td>AB1601</td><td>Koh Cheng Boon</td></tr><tr><td>CZ2002</td><td>Zhang Jie</td></tr><tr><td>CZ2003</td><td>Alexi Sourin</td></tr><tr><td>CZ1011</td><td>Lana Obratzsova</td></tr><tr><td>BC2406</td><td>Neumann Chew</td></tr></table> <p>CZ2002</p> <p>Do you want to?</p> <table><tr><td>1</td><td>Print students by lecture</td></tr><tr><td>2</td><td>Print students by tutorial groups</td></tr><tr><td>3</td><td>print students by lab groups</td></tr></table> <p>2</p> <table><tr><th>Group</th><th>Name</th></tr><tr><td>Tutorial Grp 1</td><td>Ben Yeo Andy Lau Carrie Wong</td></tr><tr><td>Tutorial Grp 2</td><td>Bruce Lee</td></tr><tr><td>Tutorial Grp 3</td><td>(No record)</td></tr><tr><td>Tutorial Grp 4</td><td>(No record)</td></tr><tr><td>Tutorial Grp 5</td><td>(No record)</td></tr></table>	Course Name	Course Coordinator	AB1601	Koh Cheng Boon	CZ2002	Zhang Jie	CZ2003	Alexi Sourin	CZ1011	Lana Obratzsova	BC2406	Neumann Chew	1	Print students by lecture	2	Print students by tutorial groups	3	print students by lab groups	Group	Name	Lecture	Ben Yeo Andy Lau Carrie Wong Bruce Lee	Course Name	Course Coordinator	AB1601	Koh Cheng Boon	CZ2002	Zhang Jie	CZ2003	Alexi Sourin	CZ1011	Lana Obratzsova	BC2406	Neumann Chew	1	Print students by lecture	2	Print students by tutorial groups	3	print students by lab groups	Group	Name	Tutorial Grp 1	Ben Yeo Andy Lau Carrie Wong	Tutorial Grp 2	Bruce Lee	Tutorial Grp 3	(No record)	Tutorial Grp 4	(No record)	Tutorial Grp 5	(No record)
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## 6. Enter course assessment components weightage

	Test Case	Expected Outcome
a	Enter course assessment with only exam + 1 main coursework component without sub-components (e.g. use the case stated in 4(e) in main section)	Please enter your option: 6 Please choose the course listed below: +-----+   Course Name   Course Coordinator   +-----+   AB1601        Koh Cheng Boon       CZ2003        Alexi Sourin         CZ1011        Lana Obratzsova      BC2406        Neumann Chew       +-----+ CZ1011 Please enter the exam weightage: (1-100, do not include %) 60 Does coursework have subcomponents? (true/false) false
b	Enter course assessment with only exam + a main coursework component with 2 sub-components (eg use the case stated in 4(e) in main section)	Please enter your option: 6 Please choose the course listed below: +-----+   Course Name   Course Coordinator   +-----+   AB1601        Koh Cheng Boon       CZ2003        Alexi Sourin         CZ1011        Lana Obratzsova      BC2406        Neumann Chew       +-----+ AB1601 Please enter the exam weightage: (1-100, do not include %) 60 Does coursework have subcomponents? (true/false) true Please enter the number of subcomponents: 2 What is the name of subcomponent 1? Assignment What is the weightage of Assignment (as a percentage of coursework) 70 What is the name of subcomponent 2? Class Participation What is the weightage of Class Participation (as a percentage of coursework) 30
c	Invalid data entries (eg course code, weightage percentage does not tally etc)	<b><u>Weightage doesn't tally:</u></b> Please enter your option: 6 Please choose the course listed below: +-----+   Course Name   Course Coordinator   +-----+   AB1601        Koh Cheng Boon       CZ2003        Alexi Sourin         CZ1011        Lana Obratzsova      BC2406        Neumann Chew       +-----+ BC2406 Please enter the exam weightage: (1-100, do not include %) 60 Does coursework have subcomponents? (true/false) true Please enter the number of subcomponents: 2 What is the name of subcomponent 1? Assignment What is the weightage of Assignment (as a percentage of coursework) 28 What is the name of subcomponent 2? Class Participation What is the weightage of Class Participation (as a percentage of coursework) 12 Sorry, please check your input. Please enter again! What is the name of subcomponent 1? Assignment What is the weightage of Assignment (as a percentage of coursework) 70 What is the name of subcomponent 2? Class Participation What is the weightage of Class Participation (as a percentage of coursework) 30

7. Enter coursework mark – inclusive of its components.

(Note: All mark entries should be based on 100 marks. Your application will eventually scale the marks to its component weightage percentage)

	Test Case	Expected Outcome
a	Enter valid coursework mark for the course with only 1 main component	Please enter your option: 7 Please choose the course listed below: +-----+-----+   Course Name   Course Coordinator   +-----+-----+   AB1601   Koh Cheng Boon     CZ2003   Alexi Sourin     CZ1011   Lana Obratzsova     BC2406   Neumann Chew   +-----+-----+ CZ1011 What is the coursework mark for Ben Yeo? 80
b	Enter valid coursework marks for course with 2 sub-components	Please enter your option: 7 Please choose the course listed below: +-----+-----+   Course Name   Course Coordinator   +-----+-----+   AB1601   Koh Cheng Boon     CZ2003   Alexi Sourin     CZ1011   Lana Obratzsova     BC2406   Neumann Chew   +-----+-----+ BC2406 What is the Assignment mark for Ben Yeo? 75 What is the Class Participation mark for Ben Yeo? 80
c		Please enter your option: 7 Please choose the course listed below: +-----+-----+   Course Name   Course Coordinator   +-----+-----+   CZ2002   Zhang Jie     CZ2003   Alexi Sourin     CZ1011   Lana Obratzsova     BC2406   Neumann Chew   +-----+-----+ CZ2002 What is the Assignment mark for Ben Yeo? 9 What is the Class Participation mark for Ben Yeo? 383 Please give a valid mark for the student (i.e. between 0 and 100) Enter again please: 83 What is the Assignment mark for Andy Lau?

8. Enter exam mark

(Note: All mark entries should be based on 100 marks. Your application will eventually scale the marks to its component weightage percentage)

	Test Case	Expected Outcome
a	Enter valid exam mark for the valid course	Please enter your option: 8 Please choose the course listed below: +-----+-----+   Course Name   Course Coordinator   +-----+-----+   AB1601   Koh Cheng Boon     CZ2003   Alexi Sourin     CZ1011   Lana Obratzsova     BC2406   Neumann Chew   +-----+-----+ BC2406 What is the examination mark for Ben Yeo? 75

b	Invalid data entries(eg course code, student ID, mark range etc)	Please enter your option:
		8
		Please choose the course listed below:
		+-----+
		Course Name   Course Coordinator
		+-----+
		CZ2002   Zhang Jie
		CZ2003   Alexi Sourin
		CZ1011   Lana Obratsova
		BC2406   Neumann Chew
+-----+		
CZ1011		
What is the examination mark for Lance?		
101		
Please give a valid examination mark for the student (i.e. between 0 and 100)		
Enter again please:		
100		
+		

## 9. Print Course statistics

(Note: You should have at least 15 students' results for 1 course pre-populated)

	Test Case	Expected Outcome
a	Enter valid course code	<pre>Please enter your option: 9 Please choose the course listed below: +-----+   Course Name   Course Coordinator   +-----+   CZ2002        Zhang Jie             CZ2003        Alexi Sourin          CZ1011        Lana Obratsova        BC2406        Neumann Chew        +-----+ CZ2002 Statistical summary of course CZ2002: +-----+   Number of students registered for the course   15   +-----+   Examination grade percentage (60%)             48.48%   +-----+   Coursework grade percentage (40%)              28.62%   +-----+   Overall grade percentage                       77.10%   +-----+   Highest overall grade                         94.36%   +-----+   Lowest overall grade                          50.32%   +-----+</pre>
b	Invalid data entries(e.g course code, mark range etc)	<pre>Please enter your option: 9 Please choose the course listed below: +-----+   Course Name   Course Coordinator   +-----+   CZ2002        Zhang Jie             CZ2003        Alexi Sourin          CZ1011        Lana Obratsova        BC2406        Neumann Chew        +-----+ dueajfam Please make sure you only enter the course name that is already registered in the system! Please choose the course listed below: +-----+   Course Name   Course Coordinator   +-----+   CZ2002        Zhang Jie             CZ2003        Alexi Sourin          CZ1011        Lana Obratsova        BC2406        Neumann Chew        +-----+ CZ2002 Statistical summary of course CZ2002:</pre>



	Statistical summary of course CZ2002:												
	<table> <tr> <td>Number of students registered for the course</td><td>15</td></tr> <tr> <td>Examination grade percentage (60%)</td><td>48.48%</td></tr> <tr> <td>Coursework grade percentage (40%)</td><td>28.62%</td></tr> <tr> <td>Overall grade percentage</td><td>77.10%</td></tr> <tr> <td>Highest overall grade</td><td>94.36%</td></tr> <tr> <td>Lowest overall grade</td><td>50.32%</td></tr> </table>	Number of students registered for the course	15	Examination grade percentage (60%)	48.48%	Coursework grade percentage (40%)	28.62%	Overall grade percentage	77.10%	Highest overall grade	94.36%	Lowest overall grade	50.32%
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#### 10. Print student transcript.

(Note: For this function, besides the individual overall course mark and grade, it will also print the student's individual component marks – exam, coursework, subcomponents. The configured weightages should be displayed as well.)

	Test Case	Expected Outcome																								
a	Enter valid student ID	<p>Please enter your option: 10 Please enter the student name: Ben Yeo</p> <table><tr><td>CZ2002</td><td>Raw Mark</td><td>Overall Percentage</td><td>Component Mark</td></tr><tr><td>Examination (60%)</td><td>84</td><td>60%</td><td>50.4</td></tr><tr><td>Coursework (40%)</td><td></td><td></td><td></td></tr><tr><td>    Assignment (70%)</td><td>9</td><td>28%</td><td>2.5</td></tr><tr><td>    Class Participation (30%)</td><td>83</td><td>12%</td><td>10.0</td></tr><tr><td colspan="4">Total: 62.9</td></tr></table>	CZ2002	Raw Mark	Overall Percentage	Component Mark	Examination (60%)	84	60%	50.4	Coursework (40%)				Assignment (70%)	9	28%	2.5	Class Participation (30%)	83	12%	10.0	Total: 62.9			
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Total: 62.9																										
b	Invalid data entries (e.g. wrong student ID)	<p>Please enter your option: 10 Please enter the student name: dioeafmae Please make sure you only enter the student name that is already registered in the system! Please enter the student name: Ben Yeo</p> <table><tr><td>CZ2002</td><td>Raw Mark</td><td>Overall Percentage</td><td>Component Mark</td></tr><tr><td>Examination (60%)</td><td>84</td><td>60%</td><td>50.4</td></tr><tr><td>Coursework (40%)</td><td></td><td></td><td></td></tr><tr><td>    Assignment (70%)</td><td>9</td><td>28%</td><td>2.5</td></tr><tr><td>    Class Participation (30%)</td><td>83</td><td>12%</td><td>10.0</td></tr><tr><td colspan="4">Total: 62.9</td></tr></table>	CZ2002	Raw Mark	Overall Percentage	Component Mark	Examination (60%)	84	60%	50.4	Coursework (40%)				Assignment (70%)	9	28%	2.5	Class Participation (30%)	83	12%	10.0	Total: 62.9			
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