University of West London School of Computing and Engineering	

Applied Software Engineering

Title	**Object oriented Modelling**
Module	Applied Software Engineering
Module Code	**CP60019E**
Module Leader:	Samia Oussena
Set by:	Nasser Matoorian
Moderated by:	Samia Oussena
Assignment	In-class assignment
Hand in arrangements	This assignment must be submitted to the Assessments area of the module on Blackboard.
Structure of assignment	This assignment has one element. Each element has a specific weighting, and its own criteria. The assessments are described below. The learning outcomes of the module are assessed by a successful completion of all the elements.

Element	**Type**	**Weighting**	**Due Date**
1	In-class demo	20 marks	Monday 21 Nov 2016
	Report	80 marks	Friday 25 Nov 2016

Extensions will only be granted in exceptional circumstances. Extensions will be for 10 days or less. Documentary evidence will be required. Extensions must be agreed before the deadline. Submissions up to one week late with no extension will be marked with a maximum mark of 40%.

Learning outcomes	1	Understand the notion of software engineering and why it is important
	2	Analyse the risk factors associated with phases of the software development life-cycle and generate possible strategies to mitigate the risks.
	3	To know various techniques and notations for understanding problem domain
	4	To appreciates the role software architecture in software development and be able to characterize some important architectural styles
	5	To understand the role of design patterns and be able to illustrate their properties
	6	To be able to discern desirable properties of a software design
	7	To understand the general flavour of object-oriented analysis and design
	8	To be aware of the major software testing techniques
	9	To be able to discern major causes of maintenance problems and be aware of reverse engineering, its limitations and tools to support it

<table>
<tr><th colspan="5">Element 1</th></tr>
<tr><td>Title</td><td colspan="4">In-class Viva and Presentation</td></tr>
<tr><td>Task details</td><td colspan="4">This assignment is accompanied with a case study describing a high level system specification for an application.

You are required to provide an implementation for ONLY ONE appropriate use case,

Tasks:

Based on the specified use case, you are required to provide an implementation and associated testing for the outlined system. You may use any programming language of your choosing and may populate the system with appropriate data you have created for testing purposes.

In addition you are required to produce a report detailing a critical analysis of the system and its development. This report should critique the system using software engineering best practices as considered throughout the module.

In the demo session, you have to present your work to your tutor and be able to answer questions.</td></tr>
<tr><td rowspan="2">Marking Guide</td><td>Criteria</td><td>Issues</td><td>Mark</td><td>Marking breakdown where appropriate</td></tr>
<tr><td>Implementation</td><td>Main parts of your design correctly implemented and questions answered.</td><td>20</td><td></td></tr>
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Element 2				
Title	**Implementation and Report**			
Task details	This assignment is accompanied with a case study describing a high level system specification for an application. You are required to provide an implementation for ONLY ONE appropriate use case, **Tasks:** Based on the specified use case, you are required to provide an implementation and associated testing for the outlined system. You may use any programming language of your choosing and may populate the system with appropriate data you have created for testing purposes. In addition you are required to produce a report detailing a critical analysis of the system and its development. This report should critique the system using software engineering best practices as considered throughout the module. Documentary evidence (including diagrams, source code, literature references etc.) should be provided as appropriate within your report. **Note: You report should be a single PDF document containing the completed software listing should be submitted.**			
Marking Guide	**Criteria**	**Issues**	**Mark**	**Marking breakdown where appropriate**
	UML modelling design	Have captured the application functionality in a use case diagram. Have you provided a class diagram which captures all elements of the system? Do you explore the issues involved in the engineering task required and software design required? Have you understood the main functions that must be provided by the system? Have you documented your engineering analysis findings?	25	Use case Description **5 marks** Class diagram and domain model with appropriate refactoring and abstraction **10 marks** Sequence diagram and associated analysis exploring system behaviour **5 marks** Architecture diagram **5 marks**

	Implementation	Have you produced a software product which captures the system requirements? Note: An implementation for GUI is optional. Have you exhibited software engineering best practices regarding system decomposition, structure, code consistency, documentation etc.?	25	Software and source code including appropriate running instructions **15 marks** Use of appropriate design patterns **10 marks**
	Software testing, documentation, and verification considerations	Have you demonstrated understanding of software testing including appropriate code? Have you managed to implement appropriate testing for the code you have produced? Have you provided seed or testing data for the system? Do you understand the TDD approach? Did the implementation address all the required functionality for the system? Have you provided clear and concise instructions regarding how the system and its tests should be launched? Do you have an understanding of the testing requirements? Have you produced code listing and explanation?	15	System tests (e.g. unit/ integration etc.) and test data **15 marks**
	Design/implementation critique	Do you demonstrate the ability to understand and critically evaluate aspects of software engineer that you adopted? Are your conclusions justified?	15	

Case Study

Saxon Heritage

Saxon Heritage is a charity that maintains buildings, gardens and monuments that are of national interest on behalf of the Government. Examples of sites of national importance are: Stonehenge and Tintagel Castle. The locations of sites are distributed across England. However from a marketing perspective, England is divided into a number of regions so the sites are actually located in a region. There are 6 regions: These are: South East; London; South-West; Midlands; North East and North West. Each site has its own charging structure for members, non-members; adult, child and family rates. These rates are based on popularity.

Each heritage site is flagged as a Gold, Silver or Bronze site, which denotes the popularity of the site. Sites, which receive less than 10000 visitors per annum, are tagged as Bronze; Sites, which receive between 10000 and 30000 visitors, are tagged as Silver; Sites, which receive more than 30000 visitors, are tagged as Gold Sites. Each year on Dec 30th the tagging is required to be automatically set based on the preceding year's figures. During the tagging process, prioritisation for inclusion on any marketing campaigns is also decided.

Periodically, each region will run its own advertising campaigns, which will focus on a number of sites. Each campaign has a specific focus. For example, "Castles in Wales" was the last focussed marketing campaign. The Marketing Manager is responsible for ensuring that no site features in two consecutive marketing campaigns. If a site features in a campaign, then the visitor targets for that site are updated with an additional percentage as there is historical evidence that marketed sites always do well. Once a campaign has been run, the visits to the featured site are monitored and senior management requires reports on visits.

Senior management also require reports, which enable them to compare targets and performance of regions. Senior Management will set targets to regional directors on the number of visitors to each site and for the region as whole. The region target is based on the sum of the all the site targets and an additional 10%. Individual sites, which fail to meet their visitor targets by more than 20%, are priority sites for the first marketing campaign for the region in the next year.

Saxon Heritage manages a membership scheme where membership of the charity is encouraged. Membership provides a number of benefits such as free entry to the sites; a monthly magazine; various promotions and half price entry to the equivalent Celtic Heritage Charity. Benefits are constantly updated to reflect the competitive nature of the charity industry. Members are encouraged to submit visitor reports. If they submit 5 reports they are entitled to free entry on their next visit. Reports on the visits to sites made by members are also monitored and updated for the website. There is a membership fee and a membership only becomes active if the fee has been paid. If the membership has been paid by direct debit then a letter is sent out to members letting them know that a payment has been collected. The administrator is responsible for this. If payment was received by cheque, then a reminder is sent to the member to renew their membership four weeks before the membership is due to expire. Members who renew their membership after the renewal date are charged an extra 5 pounds for administration.

Sometimes a member may elect to suspend their membership for some reason (e.g. out of the country for period of time). They must state how long the suspension is for. The renewal date is consequently pushed back. If a member cancels a direct debit then the membership is also suspended.

There is a requirement to design a new information system, which will handle reporting of site visits for regions; performance setting and membership. In addition there is a great desire to push as much responsibility to the customer wherever possible. So for example, it is preferable that members administer their own details.