

School of Science and Technology

COURSEWORK ASSESSMENT SPECIFICATION

MODULE CODE	:	SOFT20091
MODULE TITLE	:	Software Design and Implementation
MODULE LEADER	:	Dr Joanna Isabelle Olszewska
TUTOR(S)	:	Dr Giovanna Martinez Arellano
TITLE	:	SDI Portoflio
LEARNING OUTCOMES ASSESSED	:	K1 to K4
CONTRIBUTION TO ELEMENT	:	S1 to S3
DATE SET	:	Tuesday 1st November 2016 (Teaching Week 14)
DATE OF SUBMISSION	:	Tuesday 2 nd May 2017 (Teaching Week 40)
SUBMISSION METHOD	:	NOW Dropbox
FEEDBACK DATE	:	Tuesday 23 rd May 2017 (Teaching Week 43)
FEEDBACK METHOD	:	mark and written feedback in NOW
NOTE	:	The usual University penalties apply for late submission and plagiarism. Please consult your student handbook for further details.

I. Assessment Requirements

Given the problem scenario in Section II, **produce a report, a software program, and a video, and present a software demo.**

Software demos will be organized during the usual timetabled lab sessions in Teaching Week 41 (week starting Monday 08/05/17).

The portfolio (one per group) should be submitted electronically through NOW Dropbox by Tuesday 2nd May 2017 23:55 (Teaching Week 40):

- *Students should use the following convention for naming their folders and files:*
'GroupX_SDI_Report'
(for example, Group X –number of the group – report for the assignment of the module SOFT20091). You are also advised to add this information to the header section of your submitted document.
- *All files must be submitted in a single, main folder per group. The folder should include your report (doc file), a video, and subfolders such as:*
 - *CODE containing all the code files;*
 - *UML with the UML files;*
 - *TEST with any test dataset/database or readme file with link to it;*
 - *RESULTS with results material/images/videos.*

The assessment contributes to all learning outcomes as indicated.

Take regular backups of your work. This will enable you to recover quickly should the system fail and also allow you to backtrack if your development goes astray.

Ensure that the work submitted will execute on University computers.

Keep evidence of the submission of your assignment, and a copy of your assignment in case of the unlikely event of any loss.

Special Instructions

'Ground rules' for Group Work:

Permissible group size: 1 to 5 students.

Managing group work is part of the assessment and a brief paragraph of the report should summarize this experience you could highlight when you apply for placements or job positions. Students are advised to document their group activities or keep evidence of them. They could include (some of) them in an Appendix into the report. Changes on memberships of work groups will be not allowed after Teaching Week 26.

In each group, one person should volunteer to be responsible for submitting the group work in time by uploading the folder with all the components into NOW (see also above-mentioned explanations).

For each group, all students will have the mark for the group, unless there is strong evidence one student had not contributed to the group project and this student having poor attendance of the module. Moreover, the result of the individual test set end of Term 1 will mitigate each student's mark by $\pm 10\%$.

Warning on Assessment Offences:

Careful referencing of sources is vital when making use of the work of others. You are expected to employ the referencing conventions recommended in the Course, i.e. Harvard style. These conventions apply to information taken from internet sources, as well as books, journals and lectures. If you are unsure of the way to reference properly, seek advice from a member of staff before you submit the assessment. These are some of the points you should check before submitting your work:

- Are all direct quotations, from both primary *and* secondary sources, suitably acknowledged (placed in quotation marks or indented)?
- have you provided full details of the source of the quotation, according to the referencing convention used in the Course?
- have you acknowledged the source of ideas not your own, even if you are not quoting directly from the source?
- have you avoided close paraphrase from sources? (Check that you are not presenting other people's words or phrasing as if they are your own.)
- if you have worked closely with others in preparing for this assessment, is the material you are presenting sufficiently your own?

More details about referencing, including a quick referencing guide and a tutorial about plagiarism, details of how to reference sources such as websites, online journals, newspaper articles, and official publications, could be found in the Library.

If you are unsure of the way to reference properly, look at the "Cite them right" book (Richard Pears and Graham Shields (2008). *Cite Them Right: The Essential Referencing Guide*. Newcastle-upon-Tyne: Pear Tree Books.) available on Amazon.

In submitting your work for assessment, you are making a statement that it is your own work, it has not been submitted for any other assessment, and it does not infringe the ethical principles set out in the University's Research Ethics: Principles and Procedures.

II. Assessment Scenario/Problem

Problem

The purpose of this assignment is to provide some experience and insight:

- in designing a piece of software using:
 - at least one of the data structures (e.g. queues/stacks/graphs/trees) proposed in lectures;
 - at least one of the sorting or searching algorithms studied during the lectures;
- in implementing the corresponding code in C++;
- in producing the related documentation, including:
 - software design and specifications using UML;
 - software tests and analysis of performance and algorithm complexity.

Students have the freedom to make their own choice about the software requirements, implemented functionalities, adopted design, used analytical methods, and built test cases, while students should respect at all times the University Regulations, in particular Ethics Procedures and BCS Code of Conduct, and the project should comply with all H&S regulations.

Submission

For each students' group, the following three components should be submitted:

1. Group Report

The report should consist of:

- a brief overview of the studied problem;
- requirements specifications using:
 - o UML Use Case Diagrams,
 - o UML Activity/ Sequence Diagrams,
 - o UML Class Diagrams;
- a description of your adopted approach, including
 - o brief explanations and justifications of the followed Software Development Life-Cycle; software functionalities using MoSCoW analysis; used analytical techniques; proposed method design; adopted patterns; used object-oriented technology and standard C++ libraries. Make links to the state of the art to back your claims/assumptions/choices;
 - o detailed explanations of the selected data structure and its use in the developed system. Provide analytical details and justify your choices.
 - o among the algorithms studied in the lectures, choose (at least) one adequate for your application and justify your choice. Explain how the algorithm will work within your system and detail its steps.
- comments about the software implementation, parameters, and adopted software testing process and metrics;
- a discussion about your results (reflection on testing approach, reflection on performance such as computational efficiency, reliability, security, portability, maintainability, scalability, etc., analysis of system performance using e.g. big O-notation);
- conclusions (reflection on the adopted methods and alternatives, reflection on the development and SWOT analysis, reflection on Professional, Social, Ethical, and Legal aspects, reflection on possible improvements).

The report should also contain in appendix pictures of flow charts, design diagrams, screenshots of set-up/windows, images/tables with the testcases, test images, results (tables, output images, performance histograms, etc.).

The report should include relevant references to the source materials and tools used.

2. Code

Debugged source code, in C++ should be structured and commented.

3. Video

A short (2-3 minutes) video should summarize the key points of your coursework (e.g. general presentation/context of the problem, technical explanations of the problem, proposed architecture/design, achievements/results, conclusions). You can create this video using CAM Studio or some other screen-capture software such as recordMyDesktop (only for Linux). Please note that you need to upload your video in *NOW* or provide it via a hard support (e.g. DVD, USB key, etc.), depending on the size of the file.

III. Assessment Criteria

The following grade table will be used for marking. Note that the overall grade will be determined by the application of the Criteria Grid (see pp.6-7).

Grade	Content
<30	Requirements not met; not recoverable.
30 to 39	Report is inadequate. Code is not running. Video is missing. Demo is very limited in parts.
40 to 49	Report meet basic requirement correctly but limited, just adequate but not innovative or interesting. Code quality (functionality, documentation) is limited. Video is provided. Demo is acceptable, perhaps limited.
50 to 59	Report is coherent and organised, some evidence of self-criticism concerning deliverables. Code quality (functionality, documentation) is good. Video is correct. Demo is mostly good, some inconsistency could appear.
60 to 69	Report has good reflection, is coherent and well organised; good integration of academic & practical knowledge, good evaluation of deliverables. Code quality (functionality, documentation) is excellent. Video is interesting. Demo meets good standard.
70+	Report has excellent reflection, evidence of elegance, analytical analysis, innovation; very good evaluation of deliverables. Code quality (functionality, documentation) is excellent and deals with complex functionalities. Video is excellent. Demo is of a high standard.

Mark %	Grade & Characteristics	Theory & Academic Approach	Practice & Deliverables
0	Fail	plagiarism, collusion, non-pres., name only	as theory
1-9	Fail	no understanding, very short, inadequate	no effective deliverables
10-29	Fail	factual but little interpretation, lacks coherence, short, errors, misconceptions	requirements not met; not recoverable
30-39	Reassess: inadequate but recoverable with limited effort	coherent but mechanical notes, basic task OK but limited - partial - rudimentary answer, limited interpretation, lack of knowledge of topic, weak English but some appropriate use of language of topic	deliverables partially complete, not all requirements met, limited response to brief.
40-49:	3rd, D Pass: Sufficient for award of credit adequate mainly descriptive approach, fair, limited conceptual or theoretical ability	adequate response, demonstration of basic knowledge, relevant content, clear intention communicated, evidence of reading, acceptable minimum level of English for business presentation but may lack precision, some limited analysis / application of knowledge / theory / weighting of evidence, inconsistent	deliverables meet basic requirement correctly but limited, just adequate but not innovative, interesting or exciting, for higher marks, 45+ just exceeds minimum specification, might be good in some areas but not consistent
50-59	2ii, C Satisfactory Satisfactory with some conceptual ability but lacks good evaluation or synthesis of ideas	good response to task, collates info, <i>satisfactory</i> analysis & judgement, constructs generalisations based on evidence & opinion, argues clearly, logically & constructs a case, some limited ability to state a personal position, correct English with few imprecise statements	good deliverables, some evidence of good design or execution, coherent and organised product, some limited evidence of self criticism concerning deliverable, some independence, initiative, autonomy, appropriate techniques, integration of knowledge for task

60-69	2i, B Good. Good analysis, evaluation, synthesis, integration & argument.	evaluates info. & synthesises generalisations, good ability to state & defend personal position, good analysis & judgement, applies knowledge to new situations, sound on theory, critical, understands limitations of methods, selective coherent & logical approach, well written with clear, correct and precise English	all criteria met to good standard, evidence of good design or execution, good integration of academic & practical issues, solid evidence of self critique/evaluation of deliverables, products well organised - documented - coherent. Evidence of independence, initiative, autonomy, creativity, adaptability, resourcefulness. Integration of knowledge,
70-79	first class, A, Excellent. as above but also stronger evidence of excellent, original, innovative, articulate work	very strong ability to state & defend position, uses criteria & weighting in judgements, wide knowledge and theoretical ability, full understanding of possibilities and limitations of methods & theories, 75+ more original, innovative approach, command of critical positions, lively articulate writing, excellent grasp of material - synthesis of ideas	most criteria met to high standard, strong evidence of evaluation of deliverables, 75+: deliverables excellent - all criteria met in clear and definite manner, evidence of excellent design or execution, elegance, innovation, very good evaluation of deliverables,
80-89	Outstanding. as above but also authoritative, superlative, creative	as above but also :- seen all possibilities in task, gone beyond accepted conceptual/critical positions, evidence of creative, intelligent, innovative approach consistently & forcefully expressed	as above but also :- all aspects of deliverables superlative beyond 80% emphasis on theory rather than practice/deliverables
90-100	Faultless	as for 80-89 but also :- all work superlative & without fault	as for 80-89

IV. Feedback Opportunities

Formative (Whilst you're working on the coursework)

You will frequently be given informal verbal or written feedback regarding your (or the class's) performance on tasks relating to the coursework assessment during the seminar and/or laboratory sessions. Attendance is therefore important for your development and thus coursework success.

Summative (After you've submitted the coursework)

You will receive specific feedback regarding your coursework submission together with your awarded grade when it is returned to you. Clearly, feedback provided with your coursework is only for developmental purposes so that you can improve for the next assessment or subject-related module.

V. Moderation

The Moderation Process

All assessments are subject to a two-stage moderation process. Firstly, any details related to the assessment (e.g., clarity of information and the assessment criteria) are considered by an independent person (usually a member of the module team). Secondly, the grades awarded are considered by the module team to check for consistency and fairness across the cohort for the piece of work submitted.

VI. Aspects for Professional Development Portfolio

The report and video (2-3 minutes) elements will be a useful addition to your Personal Development Portfolio and will help you when applying for placements or job positions.