A.1.c Many students did not explicitly state which software units called the functions. They are all called by the Web server (or Servlet container), and in the instance of doGet and doPost they are called via the service method.

A.1.e The attribute color="red" is deprecated and should not be used. CSS should be used for styling, and to get the full benefit of CSS (particularly over a whole site), it is important to define styles in an external CSS file (not inline CSS). To get the full mark for this part of the question, this had to be made clear.

A.1.i The answers to this question were often poorly explained. Saying that client side scripts run on the client, and server side scripts on the server, did not demonstrate full understanding of the difference between the two. It is important to note that client side scripting changes the content or UI behaviour of the page and how it appears to the user; server side scripts are used to generate the page in response to client requests.

B.2.b The discussion of AJAX in the answers to this question rarely gave a good account of how it helps users. In particular, we expected people to note how AJAX allows state to be maintained, and how it improves responsiveness, as it allows users to continue interacting with the page while waiting for a server response.

B.2.c A full answer to this question should include discussion of both the authoring and testing processes, and should include mention of applying Web standards, validation (noting that this is necessary, but not sufficient) following guidelines (e.g., WCAG 2). Performing end user testing (in addition to acceptance testing, which is predominantly for checking software meets requirements) during the development process is the most reliable way of identifying issues. Ideally, development and end user testing should be conducted iteratively.

B.3.b There were some excellent explanations of the JSF lifecycle, but quite a few students produced an accurate overview diagram, and failed to explain it, or gave an erroneous explanation. To get full marks, it was important to provide an overview, demonstrate an understanding of what happened at each step, and state that the route through the lifecycle may vary considerably, in response to processing that happened at each of the stages.

B.4.a.iv The relationship between the JSF page and component tree generally needed more detailed explanation, particularly noting that there is a sub-hierarchy of special tags and that the associated UI components are organised as a tree isomorphic to this sub-hierarchy and generated by the JSF framework.
The exam contains two research papers not read by the students during the course. Each student has to select one of the papers and provide a critique of the paper following the answers provided.

Most of the students selected the research paper (DeNovo) rather than the paper (Safe Java Futures; only two students).

In general the questions were answered quite well. A few answers concentrated too much on the precise and too little on the analysis. Those who followed the guidelines, established during the course unit, for the evaluation of research papers tended to produce the best answers.

Very few students did not explain well the requirement for cache coherence in multicore systems or explain well the proposed protocol in DeNovo. Most students did not go beyond the obvious limitations for the DeNovo paper.
The exam was taken by 41 students, the mean was 64.2%, with close to 40% of the students getting a mark above 70% and 12% a mark below 50%, so the distribution is, as expected, bulging on the higher marks. Both questions were well answered for the most part, the means for Q1 and Q2 were 63.8% and 64.6%, respectively, with Q2 having a larger standard deviation than Q1. The following can be observed in terms of more widespread misunderstandings. In Q1, item (b), there was a widespread failure to cite the declarative v. procedural dichotomy between the calculus and the algebra. In Q1, item (c), most students failed to spot that the main difference between the domain and the tuple relational calculi is that, in the former, variables range over values in attribute domains while in the latter the range over tuples in the relation extent. In Q2, item (b), there was confusion caused by the syntactic shorthand used (i.e., 'suppliers' == 'select * from suppliers', or 'parts' == 'select * from parts') but no student was penalized for being tripped by this usage. Another source of confusion in Q2, item (b) was the absence of an equivalence rule for 'pname'. Most students failed to conclude that 'NULL as pname' would have to appear in the SELECT clause. Again, no-one was penalized for this widespread misunderstanding. More subtly, most students felt that because 'parts' was vertically partitioned in Tac w.r.t. Cat, a join was required, but in fact one of the vertical partitions doesn't need to contribute to the population of 'parts' in Cat. This was very lightly penalized. Finally, in Q2, item (e), most students missed the simplest answer, i.e., than in TinyDB/SNEE items are pulled from streams by the query engine, whereas in Aurora items are pushed onto the query engine.
Answered very well on the whole. Two questions caused difficulties but these were testing further reading, so this was expected.

Section B (choose 2 from 5)
21 Branch and Bound
Popular choice. Answered well by most people. A common mistake was not to check feasibility of solutions.

22 Dynamic programming
Answers for the first part on shortest path were generally good but some students gave irrelevant information and were not concise (precise) about what optimal substructure is. Few got full marks because negative weights were not mentioned or considered.

23 Evolutionary algorithms
A popular choice. Many students dropped a mark because of not evaluating solutions in their algorithm. The last part about designing a crossover for the TSP caused difficulty; most people got 1 or 2 out of for this part though.

24 Simulated annealing. Very unpopular question. Last part about whether the representation covered all possible solutions was not answered well; some people gave irrelevant information instead.

25 Multiobjective optimization. Answered well by most who attempted it. The last part involving reasoning about an archiver caused difficulty but many still picked up a mark for their attempt.
Q1.a This was simple and most answers were good but some failed to give more than 1 reason.

Q1.b Mainly OK answers but some people missed the word "address" and others somehow thought the question was all about Mobile IP.

Q1.c & d Some good answers but a surprising number of answers had no idea what protocols were being queried.

Q1.e Mixed response to a standard question about WLAN security. Just dealing with the sub-questions as they arise is sufficient. There is no need to write a flowing essay. There were some very good answers but some poor ones as well.

Q2.a Most answers concentrated on 2G (GSM) terminology though there was considerable evidence of terminology confusion throughout. Other than using signal strength few answers showed awareness of any other factors that might be used; this was a gift of marks if exploited. Signal quality being important for most systems - the number of frames with errors. It seemed that little had been learned about the different roles and partnerships involved in even relatively simple GSM horizontal handover cases.

Q2.b Again factors that might be used to decide when to handover were largely missing as was the way in which systems obtain information about available handover partners e.g. using 802.21 which was taught. Some answers had schemes for carrying out the handover but the opportunity to suggest sensible approaches was missed by several people.

Q3.a It seemed that most understood why TDMA was replaced by CDMA between 2G and 3G. Answers needed to have at least 6 clear points be they positive or negative and this was not supplied in some cases.

Q3.b Again more points were needed to justify higher marks being allocated.

Q3.c This was directly taught but most answers only gave one reason.

Q3.d Here it was important to notice just how little data was collected by each sensor - just a few bytes per hour. Most answers tried to adapt standard WLAN MACs a little, typically by adding sleep time. Good answers realized a simple pre-determined time schedule with some allowance for clock drift would solve this network's needs with very little complexity or energy usage.

Q4. Everyone attempted this question and the average mark was respectable, but only just. The question is based on Barry's Lecture 5 with some ideas from the laboratory. Q4 (a) was reasonably addressed, but not always with the clarity required. Some people wrote too much.

Q4 (b): most people answered the first part correctly but less than half remembered the vital point asked as the second part.

Q4 (c) produced reasonable answers. Lots of useful error control techniques such as interleaving are possible with streaming because of the larger buffer. These become more restricted or impossible with interactive VoIP. Note that it is not fair to say that TCP is 'too slow' for streaming and interactive VoIP. Its ACK/retransmit facilities are too expensive or just not useful.

Q4 (d) : most people seemed to understand the ideas required (CSMA and sleep mode, polling, etc.) though some answers were a bit 'scappy' and not well expressed.

Q5. About half answered this question. The average was not high, but disregarding one especially low mark produces a respectable average. Many people understood the point of part (a) and sketched nice sinc pulses with zero-crossing intersections. Part b involved some simple calculations, but there was an unintentional trap. Having worked out the channel capacity correctly, several people then concluded that using QPSK (sub-question (ii) ) would double the channel capacity as the maximum achievable bit rate.
What an embarrassing slip! The channel capacity is the channel capacity!! You cannot send a higher bit rate without uncontrolled, uncorrectable errors. That’s the Shannon Hartley Law. Actually few people answered ‘to no extent’ to sub-question (iv) which I thought was the easiest question imaginable. Part (d) about fading and OFDM was reasonably understood by those who answered it, though answers tended to lack detail.

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Comments on the examination

1. General comments

These comments are made in relation to unmoderated, unapproved scores.

3 candidates sat the examination, therefore potential for interpretation of statistics is somewhat limited. 2 candidates achieved a score of 33.5/60 (55.83%), the other achieved a score of 20/60 (33.33%). All 3 candidates answered questions 1 and 4. Question 3 was answered by 2 candidates and question 5 by 1 candidate. It was noticeable that no candidate attempted question 2, which was largely concerned with machine learning for text mining. This is somewhat surprising given that candidates had previously taken COMP61011 Machine Learning and Data Mining, thus should have been well positioned to tackle question 2. However, the small population would also account for this. In several cases, parts were not attempted, which would clearly lead to depressed scores.

Preparation time for this examination was short, given the early scheduling of the examination while the course itself was scheduled for the last period of MSc teaching, which may have had an adverse impact. Reports from students regarding overall coursework load (on all units), taken with reported concerns over the weightier nature of the Progress Report compared to previous years, may also indicate contributing factors. All students had engaged very well during the course, had been active in discussion and diligent in practical lab and coursework.

2. Specific comments

Question 1

Q1a: some confusion over types of ambiguity was apparent.

Q1c: the question required notation to be shown for both syntactic and named entity tagging, to obtain full marks.

Q1f: the question focussed on information useful for parsing, which was not always brought out in answers.

Question 3

Q3b: this was generally well done, although part iii) proved testing given the requirement to build upon existing representations rather than introduce edges with no previous foundation.

Question 4

Q4c: some good attempts were made. Credit was given for partially-correct work, emphasizing the importance of following the requirement to “show your working” which allows the examiner to see whether a candidate is, e.g., applying the correct methodology, even though a slip in calculation may have been made.

Q4d ii): answers showed good awareness of how context is critical for proper recognition of named entities.
Overall the performance was disappointing since the mistakes made reflected the 'warnings' of the issues covered in lectures and the groupwork. Students lost mark opportunities by writing generalised discussions (a euphemism for waffle!) rather than applying their knowledge of IT governance principles to the questions' case studies. As a result, they did not display any understanding of the subject but only the ability to (at best) regurgitate definitions. Students lost marks opportunities by failing to realise key matters such as what was the data to be made secure and who were the stakeholders involved in handling it. (This was apparent in answers being weighted to the IT administration rather than a balanced view including the data owners and users.

Some students failed to read the questions properly. The simplest error being ignoring a questions demand to use a diagram as part of their answer. Where diagrams were included, students omitted data flows, security appliances (unfortunate in questions asking for security architecture design) or created topologies with no logical structure to the governance methods employed.

This was the first year that a marking scheme was available for a previous paper. Many students were awarded marks for their ability to learn answers to reused question and repeat them by rote. This meant that they put down lists of items without explanations; the lists were designed to guide examiners in marking. Marks were awarded leniently here although it showed a singular lack of imagination to assume that a list of a few items was was worth more that an considered written paragraph which carried less marks.
1. Some statistics

The exam paper contains 5 questions, each of which has 20 marks. So the total exam marks are 100.

Students must answer Q1, but can choose one from Q2 and Q3 and one from Q4 and Q5. Therefore, the exam is marked out of 60.

The exam was taken by 31 students. According to the raw marks, 4 students have failed the exam because they have obtained less than 30 marks (one of these students has only achieved a total of 7 marks); 12 students who have achieved more than 40 marks and 15 students are in the middle, achieving between 30 and 40 marks. This means around 87% of the students have passed the exam and around 38% of them have achieved 1st class or near 1st class marks.

Between Q2 and Q3, 25 students have chosen to do Q2 and only 6 students have chosen Q3, suggesting that the majority of the students considered Q3 to be harder than Q2.

Of Q4 and Q5, 16 students have chosen Q4 whereas 15 students did Q5, suggesting that the students considered the two questions to be equally hard or easy.

2. Some observations

For Q1, most students know what the State does, but only few of them know how it works and when it is appropriate to use this pattern.

For Q2, common problems are:
- UML class diagram notation is wrong.
- The Composite pattern is shown incorrectly;
- No clue on how to calculate the total wage bill by using the Composite pattern;
- Don't know how to relate the given pattern to a specific example;
- Know what a given pattern is about, but cannot explain the purpose or motivation behind the pattern.

For Q3, the common problems among the 6 students who have chosen this question is lack of understanding of how to use the Observer pattern to represent the states of aircraft.

For Q4, the common problem is the students fail to clearly explain what each of Model, View and Control represents and how they interact.

For Q5, the common problem is that the students fail to illustrate each pattern with an example. They simply listed the examples by name!

3. Conclusion and reflection

I quite like this paper as it has tested the students' knowledge of the course comprehensively, with the depth and breadth. In particular, I found John's questions (Q2 and Q3) are very good, as they contain thinking, analysis, reasoning and application aspects of the patterns. In AY2012, I'll set my questions in the similar way as John's.
Q1
Students did very well in this question - this was expected since it was mainly standard book-work.

Question 2
This was a very popular question. Most people could remember some aspects of the ACM/ASM comparison, and made a decent job of predicting what results we would get on the images.

Marks were lost for not making the comparison explicit. For example, in 2(b), just listing some of the properties of a learnt model didn’t get full marks, unless it was also made clear that the ACM didn’t possess these properties. In part (a), the question asked people to discuss the possible results, not just show them, and not everyone noticed this.

In part (c), most people remembered the diagrams from the lectures, but weren’t specific enough about the details (for example, what exactly IS the distance in the distance map?).

In part (d), marks were again lost when people failed to give sufficient detail. Oddly enough, many people failed to mention alignment of the shapes, which was regrettable given that there was a clue later in the question! As regards PCA, again not sufficient detail, such as not mentioning the covariance matrix, or just mentioning PCA, but not explaining what use it was, or what it actually did. Almost no one mentioned the gaussian probability distribution aspect.

In part (e), many people made some reference to the image profiles or looking for nearest edges, but very few mentioned the mapping from the model frame to the image frame. With the AAM, many people remembered the point about using more image information, but no one remembered the possibility of correlation between shape and texture.

Question 3
This wasn’t a popular question, perhaps because it was split into only a few long parts, and given that this material was covered at the very end of the lecture course. As such, I have too few samples to really comment on performance.

Summary
In summary, common errors that lost people marks, even though it was quite possible that they knew the relevant material, were not giving enough detail, or not giving the information specifically asked for in the question. Diagrams and pictures tended to be recalled better than equations, and it was possible to get good marks using diagrams rather than equations as long as people explained what the diagram was supposed to be showing!

Q4
Overall students did reasonably well in this question - 4a and 4b covered standard book-work, question 4c was a little bit more challenging.

Q5
Most students did well - Question 4a covered standard book-work.