

Advanced Systems Development (IS 352) - Unit Report, Term 3, 2004.

Introduction

Examination

Introduction

Number of candidates - 259

This paper differed from past examinations in two important regards. Firstly the case study was released to students one week before the examination and they were given the chance to ask comprehension style questions about it via the discussion board. Secondly students were issued with a sheet giving them the correct UML notation they were to use in the examination.

Question 1

This question looked at various aspects of constructing a class model for the case study. There were some students who rather than answer each part of the question separately, merged their answers for parts (a), (c), (d) and sometimes (e) together. This is actually very poor examination technique and almost always results in a potential if not actual loss of marks. Candidates are strongly advised *not* to do this.

Despite students having been given a sheet showing the correct notation for them to use, a disappointingly high number of candidates refused to use the correct notation. This was penalized by removing one mark from each part of a question where incorrect notation was used. So some candidates did lose 1 mark each in parts (a), (c) and (d), a total of 3 marks lost!

Part (a) asked candidates to specialize "PaymentMethod" into 2 given classes and then further specialize one of those. There were a number of candidates who omitted the class "PaymentMethod" from their structure altogether and consequently lost marks. Most candidates made a reasonable attempt on this part scoring 5 out of the available 8 marks or 6 if they placed a "Type" attribute into "CustomerInitiatedPayment". There were a number of candidates who specialized "CustomerInitiatedPayments" in their answer to this part, despite the fact that part (b) asked for reasons why you would *not* do so!

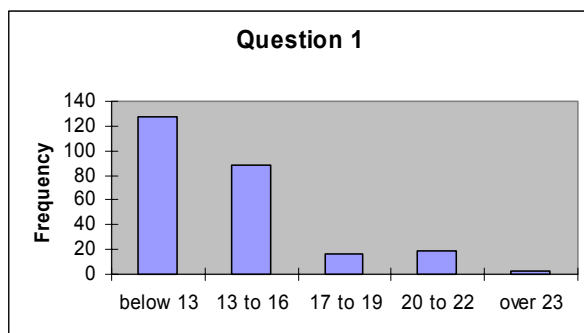
In part (b), candidates either had and gave a good reason or tended to bring in extraneous factors such as bank details etc. Those candidates who had specialized the class in part (a) had a very difficult task of trying to explain why they wouldn't do what they had actually done and very few of these candidates gained marks in part (b).

Part (c) asked for another Gen-Spec structure, this time without giving the specialization classes. Most candidates realized from the case study that "Payment" and "Refund" were the obvious choices. A few candidates used the same sub classes as they had already used in part (a) to specialize "PaymentMethod", no marks could be given for that. Most candidates gained 1 mark for the actual specialization but failed to gain marks for suitable attributes. This was because (1) there was a lamentable tendency to include a "Type" attribute in the

super class, thus negating the need for a Gen-Spec at all, and (2) candidates included the same attributes in both sub classes without realizing that they should be placed in the super class. Overall candidates showed a poor understanding of the nature of a Gen-Spec structure.

Part (d) asked candidates to draw a full class model incorporating their structures from parts (a) and (c). Some candidates did not incorporate those structures and hence lost marks, a significant number did not include the other classes that were given prior to question 1, and also lost marks. Very disappointingly, many candidates did not supply cardinalities for all of their Whole-Part structures and associations, any such without cardinalities gained no marks at all. There were still a few candidates who added in extra classes against the express orders given in the question. I do wonder whether such candidates can actually read English properly.

Lastly part (e) asked for attributes, with explanations, for 4 given classes. Most managed to give convincing attributes for two of the classes, “PhoneCall” and “Tariff” but failed with the other two. Many placed “number” or “area code” as an attribute of “PhoneNumber” for example, which showed that they had failed to appreciate the significance of this class. Actually both “PhoneNumber” and “Account” are very similar and at a later stage of design would probably be merged. However you can see from the specimen answer the kind of attributes I was hoping to see in these two classes. Some candidates achieved these, but many did not. However this part of the question was marked generously.



Statistics

No of candidates who attempted this question	253
Modal mark	16
Median mark	13
Mean mark	13.1
Standard Deviation of marks	4.83

Question 2

This question focussed on use cases. As the modal and mean marks indicate it was not well done by many of the students who attempted it. A considerable number of candidates treated it very trivially and that can be seen to some extent in the fact that they managed to squeeze their entire answer into one page! Almost everyone who did that scored low marks.

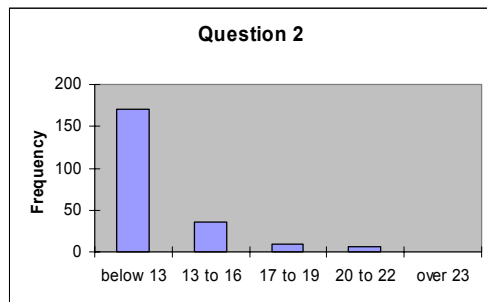
Part (a) asked for 4 additional use cases plus the initiating actor for the given 3 and the new four. It was hoped that having had the case study for a week in advance, candidates would have undertaken a use case analysis of their own to draw upon but this seems not to be the case. There were a number of “obvious” use cases mentioned in the case study itself, yet many candidates went for generic use cases such as “Open account”, “Update Account” and “Delete Account”. Candidates who used more than 1 of these 3 were only awarded marks for one of them. Many candidates tried to include the 2 “lower level” use cases referred to in part (b) as their use cases in part (a). No marks were awarded for such an obvious error. Many candidates tried to include use cases that were thinly disguised versions of the given use cases, such as “MakeCustomerInitiatedPayment”, again no marks could be given for such poor work.

The activity of identifying initiating actors was disappointing. Although it is clear from the question that only 1 such actor can be given for each use case, several candidates gave more than one, no marks could then be awarded. Again from the case study it is clear for example, that the Audit check is triggered by time, as is the production of the bill and the making of automatic payments, many candidates insisted on inventing large numbers of clerical staff of one kind or another to initiate these responses. Once again, no marks were given for such answers. The case study deliberately does not mention any manual staff and it is incorrect and unnecessary to invent them.

Several candidates used diagrams to answer part (a), this was not a good idea as in most cases such diagrams made it impossible to identify initiating actors and so marks were lost. Other candidates tried to produce one diagram to answer both part (a) and part (b). As mentioned in the report on Question 1, this is very bad examination practice, each part should be answered separately unless the question explicitly tells you that you can do otherwise.

Part (b), asked for a use case diagram, in particular to show how the 2 new use cases “MakeRefund” and “FindMistake” are related to the higher level ones by <<extends>> and <<includes>>. Many candidates failed to show these relationships at all, thus throwing away marks, whilst others showed only too well that they had no idea of the difference between <<extends>> and <<includes>>. Several candidates drew extremely complex “use case diagrams” with dozens of supposedly low level use cases, which actually were DFDs in disguise. Very few marks could be given to such answers. The question was quite clear that the diagram should contain ONLY the 7 use cases from part (a) plus the 2 new lower level ones.

Lastly part (c) asked candidates to reflect on the strategic place of use case analysis. This was poorly answered with many candidates either ignoring it or writing two lines defining a use case. Others quoted back the course notes at me, no marks for that I am afraid(!), or wrote a paragraph of repetitive material. It is disappointing that students have not reflected on the relative places and purposes of the UML tool set.



Statistics

No of candidates who attempted this question	219
Modal mark	7
Median mark	9
Mean mark	9.9
Standard Deviation of marks	4.82

Question 3

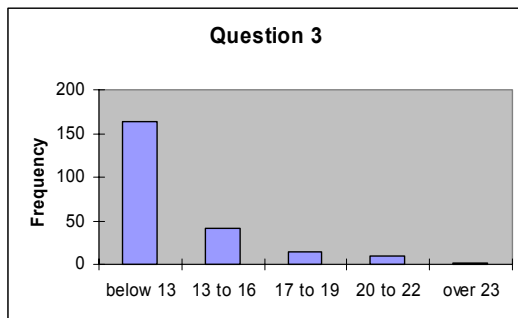
This question concerned the description of a use case firstly in textual form and then by use of a sequence diagram. There was a typographical mistake on the paper in part (a) where the question clearly asks for a description of the use case “Produce Bill” but in the formatted table given the name is shown as “Process Claim”. Most candidates realised that this latter was a mistake and produced answers for “Produce Bill”. However there were some who used “Process Claim” tying it into a customer’s request for a refund, which was mentioned in the case study. Those answers were marked as if “Process Claim” was the correct use case to use. Many candidates did not identify the initiating actor, the same mistake as was made by many in the last examination also and drawn attention to in the report on that examination which was published to this cohort of students!! Many candidates produced textual description at too high a level, basically just saying “The bill is produced” without seeking to describe how the objects within the system must collaborate to achieve that end.

Several candidates wrongly interpreted the use case as “Pay Bill” rather than “Produce Bill” and gave detailed, and completely irrelevant descriptions of how the customer paid the bill. These gained no marks. There were some candidates who, despite the explicit instruction in the question to use the given format, produced answers in a completely different format. This is just throwing marks away and demonstrates extremely poor examination technique.

Part (b) asked for a sequence diagram for the same use case. Although many candidates produced acceptable answers to this part, there were still far too many who did not. The main problem seemed to be in choosing the objects for the diagram. It was expected that candidates would choose objects from the classes that were given in the case study, possibly, if they had done question 1 as all but 6 candidates had done, augmented by the extra classes from that question. However a significant number of candidates used “System” or “Billing System” as an object which was incorrect. Even more used “Bill” as an object even though we had been at great pains to emphasize to students that things that are produced are not acceptable as objects or classes at this stage of the overall design process. There was also a significant number who used “Process Bill” or “Produce Bill” as an object thus showing they

had no idea of the distinction between an object and an operation. One further error was in the choice of an object to act as the controlling object, many candidates chose an actor for this role, which makes no sense in the context of a computerized system.

The last part, asked candidates to reflect and comment on the similarities and differences between sequence diagrams and flow charts. Clearly students had little or no idea how to do this and a considerable amount of rubbish was written. Many students ignored this part, others re-interpreted it as “the advantages and disadvantages of sequence diagrams” – no marks for that, of course – and others made some attempt at actually answering the question. Students must be more aware of comparative techniques across methodologies and paradigms.



Statistics

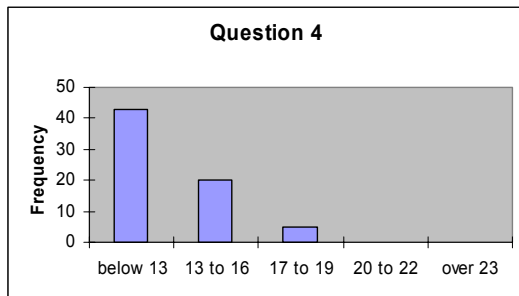
No of candidates who attempted this question	230
Modal mark	7
Median mark	10
Mean mark	10.4
Standard Deviation of marks	5.35

Question 4

The first part of this question gave two scenarios and asked for collaboration diagrams to be drawn for each of them. Although the question gave the classes involved by italicising their names, it was noticeable that candidates seemed unable to resist adding in objects belonging to new and unnecessary classes in their answers. However marks were not deducted this time for adding in those extra objects. Most candidates managed to score reasonable marks on this part.

The second part asked candidates to consider the use of control classes. These had been mentioned during the on-line chat sessions, and students’ attention drawn to them then. Unfortunately, most students had not responded to that suggestion and the answers to this part showed that candidates had little or no idea what a control class is or how to use one.

The third part asked for candidates to suggest a class to which they would assign the “Produce Bill” operation. The only two possible answers are “Account” and “Phone Number” either of which could have the required attributes. Although many candidates got this right, it was disappointing that still so many showed they were unable even to achieve this limited aim of object-oriented analysis.



Statistics

No of candidates who attempted this question	68
Modal mark	10
Median mark	12
Mean mark	11.3
Standard Deviation of marks	4.77

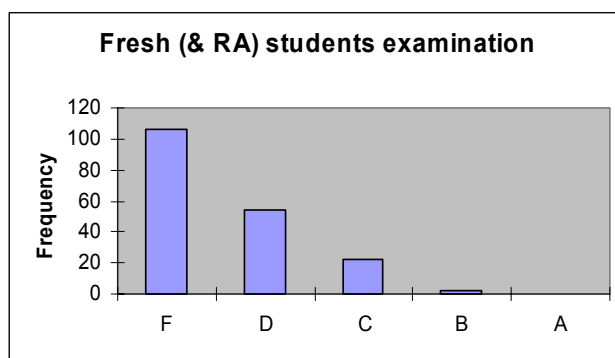
Overall

Once again, this examination has shown that far too many candidates are ill prepared for this assignment. The poor quality of many answers from the “failing” candidates gave doubt that they had even read the unit material. It was noticeable during the delivery of the unit that although some students made many postings, the great majority made none at all, and it can only be assumed that they did not try the exercises provided for them, despite it being made as clear as possible that not to join in on the discussion boards and attend the chat sessions was a road to likely failure.

Even with the case study being issued one week in advance, candidates are failing to get to grips with it and ignoring aspects of it.

The mark analysis for each question uses the total candidate population, but for comparison we are showing the statistics and graphs for Fresh (and RA) students separately from LRA students, as well as a combined set.

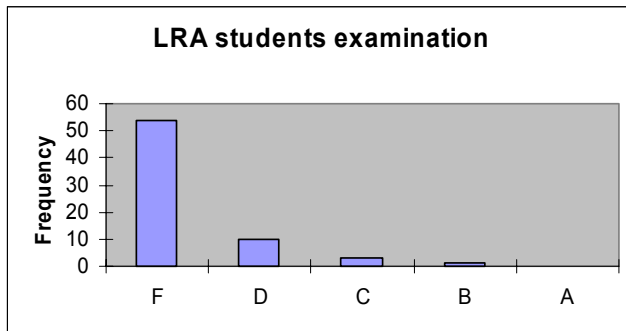
Fresh students (including RAs)



Statistics

No of candidates	191
Modal mark	40
Median mark	35
Mean mark	35.6
Standard Deviation of marks	11.88

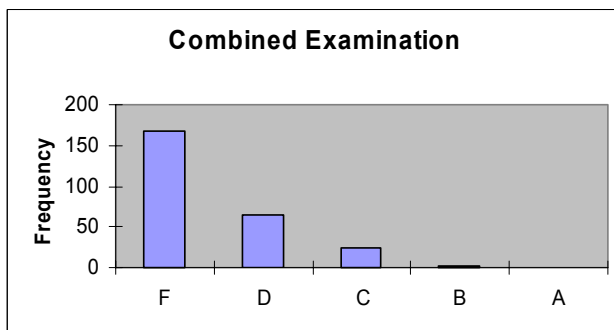
LRA students



Statistics

No of candidates	68
Modal mark	38
Median mark	32
Mean mark	31.3
Standard Deviation of marks	11.15

Combined



Statistics

No of candidates	259
Modal mark	40
Median mark	34
Mean mark	34.3
Standard Deviation of marks	11.99

Breakdown of Results by Examination Centres

We are also showing a centre by centre breakdown for all centres which had more than 5 candidates. We have classified the centres into 4 colour code groups, based on the average marks per question (concentrating on questions 1, 2 and 3 – the most popular questions) compared with the overall averages and also the pass rate. The four groups are:-

BLUE - a centre which has average marks higher than the overall average for at least 2 of the 3 questions (1,2 and 3) and a pass rate higher than the overall pass rate

GREEN – a centre which has average marks higher than the overall average for at least 1 of the 3 questions and a pass rate higher than the overall pass rate.

ORANGE - a centre which has average marks higher than the overall average for at least 1 of the 3 questions and a pass rate lower than the overall pass rate.

RED – a centre which has average marks lower than the overall average for at least 2 of the 3 questions and a pass rate lower than the overall pass rate.

Centre Code	Qn 1 Mean	Qn 2 Mean	Qn 3 Mean	Qn 4 Mean	Number Passed	Total Number	% Pass Rate
1001	16.4	12.0	12.2	10.8	19	28	68%
1701	15.6	9.9	12.7	14.0	6	10	60%
0205	15.3	11.7	11.6	14.0	4	7	57%
0301	13.0	10.1	12.7	13.9	12	25	48%
0204	11.3	11.3	10.2	8.8	4	11	36%
9700	14.4	8.8	8.9	9.6	6	21	29%
0201	12.6	9.2	10.0	8.3	7	28	25%
0212	13.6	10.3	9.2		2	9	22%
0202	12.3	9.1	10.0	12.0	5	23	22%
0000	11.1	7.8	8.6	11.9	6	29	21%
0206	12.8	8.4	7.1	9.7	1	9	11%
OVERALL	13.12	9.85	10.40	11.26	92	259	36%

Dr Jonathan Britt

January 2005.