UNIVERSITY OF TORONTO
MISSISSAUGA
APRIL 2011 FINAL EXAMINATION

CSC 301H5
Instructor: Sills

Duration — 2 hours

Examination Aids: Course textbook, Object-Oriented Software Engineering, Stephen Schach
Course notes and any other course material

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*Do **not** turn this page until you have received the signal to start.*

The University of Toronto Mississauga and you, as a student, share a commitement to academic integrity. You are reminded that you may be charged with an academic offence for possessing any unauthorized aids during the writing of an exam, including but not limited to any electronic devices with storage, such as, cell phones, pagers, wristwatch calculators, personal digital assistants (PDAs), iPODS, MP3 players, or any other electronic device. Unauthorized calculators and notes are also not permitted. Please turn the electronics off and put all unauthorized aids with your belongings at the front of the room before the examination begins. If any of these items are kept with you during the writing of your exam, you may be charged with an academic offence. A ypical penalty may cause you to fail the course.

Please note, you CANNOT petition to re-write an examination once the exam has begun.

This final examination consists of two parts on 3 pages (including this one). *When you receive the signal to start, please make sure that your copy of the examination is complete.*

Choose the questions you answer as directed. Answer each question you choose as briefly but completely as possible.

Clearly indicate where you have written your answer to each of the questions you choose.

Each question is worth 5 marks. Answer 20 questions for a total of 100 marks.

Good Luck!

Part A [25 marks]

Pick **5 questions** from the following.

Imagine you are modelling a banking system representing customers and their accounts. There are two different types of accounts, chequing and savings. Each account has an account number and a balance. In addition to standard account information, chequing accounts maintain the number of the last cheque issued by the account owner. All accounts receive a base account interest rate as well as an adjustment. A chequing account's interest rate is the base amount plus 0.5 % provided the account balance is at least $2000. A savings account receives the base amount plus 1 %. Accounts are associated with one or two (in the case of a joint account) customers. Each customer has a name, address, and social insurance number. Each customer has a collection of accounts as well as any number of bank cards. Each bank card can be attached to at most one chequing account and at most one savings account. Bank cards are non-transferable, so if a customer leaves the bank all of their bank cards are eliminated. Customers can deposit or withdraw money or transfer from one account to another. Customers can make a payment on their bank card or pay some portion of the balance on their bank card.

All questions in part A refer to the bank description.

1. Write a use case scenario for one of the transactions.
2. Draw a use case diagram for the scenario you chose in question 1.
3. Draw a sequence diagram for a different transaction, not the one you examined in questions 1 and 2.
4. Draw a state diagram for the bank transactions.
5. Draw a class diagram. Include any associations and multiplicities.
6. For one of the classes in your class diagram, give a list of what will be found in the data dictionary.

Part B [75 marks]

Start a new exam booklet for your answers to questions in Part B.

Also write all your answers double spaced.

The questions in Part B refer to your work on the Euchre assignment unless specified otherwise. If you are asked for an example you may provide an example from your's or another team's solution. If a question is based on a method or example that you did not use in the assignment instead indicate how you could have used the method or provide an example you could have included in the assignment. Clearly indicate the context of your answers. When different questions ask for examples choose them from different parts of the assignment or solution to illustrate your all round knowledge of the assignment and solution program. If answers focus on a limited domain only part marks will be awarded.

Pick **15 questions** from the following 20 questions.

1. Compare Therac 25 and Ariene 5, similarities and differences.
2. Compare subversion and unfuddle, similarities and differences.

3. In your Player how did you decide which card to play?
   OR In your Game Manager solution how did you decide which team won the trick?
4. Where could you use an unstructured interview? Provide some sample questions. Where could you use a structured interview? Provide some sample questions.
5. Describe a place in the assignment where your team reached an impasse and needed to back track, redesign and continue. How did you resolve the problem?
6. Draw your class diagram from exercise three of the Euchre game assignment.
7. How could you use the Java List class from the Java.Util?
8. Describe the difference between the application domain and the solution domain. Provide examples.
9. Provide an example of risk analysis. Provide an example of contingency planning.
10. Give an example of where you used or could use pre or pos conditions? Why?
11. Give a skills matrix for your team members including names and roles.
12. What did you include to add robustness to your solution?
13. How could you use Rapid Prototyping in the assignment? What to include? What to leave out? Why?
14. Give an example of the use of inheritance and polymorphism.
15. Where did you, could you solve a problem by using a design pattern? Describe the problem. Specify the design pattern and how it solved the problem?
16. Give an example of defensive programming used in the assignment.
17. Pick a class from your solution and provide a sample unit test suite. Indicate which are boundary cases.
18. How would the solution change if Extreme Programming methodology was used? What did we do that agrees with XP methods? What did we do that disagrees with XP methods?
19. How far in the software life cycle did you reach? Explain.
20. Write five questions that you would ask in a postmortem for your Euchre project.

Total Exam Marks = 100