

CMPUT 301
User Interfaces and Software Design
Winter 2000
Section B2 Final Exam
April 19, 2000
E. Stroulia

The exam is closed books.
There are 9 questions for a total of 100 marks
You have 2 hours to complete it.

Good Luck!

Name:
ID:

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CMPUT 301 (B2)
STROULIA, E.
APR 00 FINAL
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Question 1	(20 points)	
Question 2	(8 points)	
Question 3	(8 points)	
Question 4	(10 points)	
Question 5	(10 points)	
Question 6	(10 points)	
Question 7	(12 points)	
Question 8	(12 points)	
Question 9	(10 points)	

(Question 1: 20 points)

The table below contains a set of statements. For each statement, you have to say whether it is True or False.
(Note: \Rightarrow = implies)

Points	Question	Answer
1	Class B is a subclass of A \Rightarrow Where an instance of A is used, an instance of B could also be used	
1	Class B is a subclass of A \Rightarrow B reuses the code of all the methods of A that it does not override	
2	Class B is a subclass of A \Rightarrow For each method m of A that B overrides, the preconditions of A.m should be stronger than the preconditions of B.m	
1	Class B is a subclass of A B may not deliver a behavior defined in A	
2	1. Class B is a subclass of A 2. Class A defines an instance method m 3. B overrides m 4. B is an object instance of subclass B \Rightarrow If object b receives a message b.m, then the method defined in class A gets executed	
1	Class A is abstract \Rightarrow All methods of A must be abstract	
1	An interface may include the implementation of some of its behaviors	
1	In composition by containment, neither the container nor the contents may exist without each other	
1	In the CRC methodology of OO design, the responsibilities of a class A describe the other classes that can use the services of A	
2	Class B extends class A \Rightarrow An addition of any new method to the interface of B should take into account the interface of A	
2	Class B contains class A \Rightarrow Changes to the implementation of A will necessarily affect the methods of B that use the changed methods of A	
2	Class B extends class A \Rightarrow Changes to the interface of A will necessarily affect the B	
2	1. Class B is a subclass of A 2. Class C is a subclass of A \Rightarrow Where an instance of B is used, an instance of C could also be used	
1	Reuse by composition is essentially code reuse, as opposed to reuse by inheritance which is both design and code reuse.	

(Question 2: 8 points)

Give examples of violations of the principles of "reducing short memory load" and "enabling reversibility of actions". Discuss two examples for each principle.

(Question 3: 8 points)

Identify two techniques for coordinating multiple windows and give an example of a situation where each one is applicable (you can use examples from existing systems or make up your own).

(Question 4: 10 points)

You are developing an interface to a portfolio tracking application. A portfolio contains several different assets. You want to support trend analysis (i.e., calculating worth in time) of the whole portfolio as well as individual assets. The portfolio worth is the sum of the worth of all its assets. Design a class hierarchy to represent the above classes. Discuss (and indicate in the diagram) the relevant methods for each class, inheritance, composition and other relations among classes, as well as abstract classes and interfaces. Which pattern applies here?

(Question 5: 10 points)

You have an already developed human resources application which contains an *overtime* class, responsible for calculating the monthly overtime pay of an employee. Not all employees are eligible for overtime. You want therefore to control the access to this class, so that each time an *employee* class sends an *calc_overtime(employee)* message to it, messages from ineligible employees are blocked. You don't want to change the *overtime* class itself, because the rules for the calculations are too complex and you don't want to disturb the working implementation. Identify an applicable design pattern for this situation, explain why the pattern is applicable, and show how it should be applied by drawing the class diagram for the solution to this problem. Indicate the relevant methods for each class, inheritance, composition and other relations among classes, as well as abstract classes and interfaces.

(Question 6: 10 points)

Direct manipulation interaction style: describe the style, discuss its advantages (that is, when and why does it work well) and its disadvantages.

(Question 7: 12 points)

Your task is to design a hierarchical (tree structured) menu for selecting among videotapes available in a videostore. Consider two alternatives: for each one, discuss the principles used for grouping and for organizing the selection options at each level of the tree. Compare the alternatives in terms of ease of use (performance) and ease of learning.

(Question 8: 12 points)

You can use real users to evaluate the user interface of an application during development or after delivery and deployment. Identify one method for each category (during and after). For each of these methods, discuss why it is useful, how it should be applied, and what are its advantages and disadvantages.

(Question 9: 10 points)

Perform heuristic evaluation on the form below (there are at least 5 problems with it)

File Edit View Go Communicator

Back Forward Reload Home Search Help Print Security Stop

Bookmarks Location file:///usr/saulteaux/prof/stroulia/form.html

Google Courses Modules References Languages News People SEARCH ALL CELLEST To My Ed

ABC 101: Theory of Things
Winter 2020
Course Evaluation Survey

hello! I am the course evaluator. I am going to ask you a few questions to which you should answer truthfully and precisely.

Participant Profile

NAME:

GROUP NUMBER:

EMAIL ADDRESS:

Briefly describe your role in the project.

As part of your project you have to complete this form.

1.	How would you rate the quality of your project?	<input type="radio"/> 1. 50-70	<input type="radio"/> 2. 70-80	<input type="radio"/> 3. 80-90	<input type="radio"/> 4. 90-100
2.	How would you rate the quality of collaboration within your team?				<input type="radio"/> 1. Poor
3.	If you had your team mates in a subsequent class that required a project, would you choose to form a group (exactly the same) again?	<input type="radio"/> 1. No			
4.	How would you rate your team leader for his leadership of the project?	<input type="radio"/> 2. Poor			

Briefly describe the roles of your teammates in the project.

Are you done? Then click on "Submit Responses" below.

SUBMIT RESPONSES

CMPUT 301
User Interfaces and Software Design
Winter 2000
Section B1 Final Exam
April 26, 2000
E. Stroulia

Name:

ID:

1. The exam contains 9 questions.
2. You may not use any textbooks or notes or any other materials during the exam.
3. You have 2 hours to complete it.
4. At the end you must return this question sheet with your paper.

Good Luck!

Question 1	(20 points)	
Question 2	(8 points)	
Question 3	(8 points)	
Question 4	(10 points)	
Question 5	(10 points)	
Question 6	(10 points)	
Question 7	(12 points)	
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(Question 2: 8 points)

Give examples of violations of the principles of consistency and error prevention. Discuss two examples for each principle.

(Question 3: 8 points)

Use the Task-Action-Grammar method to design a set of commands for a spreadsheet application. The set should contain commands for inserting and deleting a new column or row, and inserting and deleting a number of cells in an existing column or row.

(Question 4: 10 points)

You want to display the time from the computer clock on a widget on the user's display, in a manner that would allow the user to change the number and type of clock widgets that s/he wants to use. Identify an applicable design pattern (there are more than one), explain why the pattern is applicable, and show how it should be applied by drawing the class and interaction diagram of the pattern in the context of your problem.

(Question 5: 10 points)

You are designing a family tree editor. In this system a *person* has two parents, a *mother* and a *father*. A person can *calculate_ancestors* for a given number of generations by invoking the same operation (i.e., *calculate_ancestors*) on its parents. Design a class hierarchy to represent the above types. Indicate the relevant methods for each class (for the method of interest, i.e., *calculate_ancestors*, describe in pseudo-code how it will be implemented) inheritance and composition relations among classes, as well as abstract classes and interfaces. Which pattern applies here?

(Question 6: 10 points)

Describe Fitts' law. Describe an experiment that you could use to evaluate its validity (you can design your own or talk about one of the experiments mentioned in class). Give an example for how it could be used for user interface evaluation.

(Question 7: 12 points)

Your task is to design a "family pictures" viewer. The viewer should enable the user to browse through a large set of pictures organized in folders, to select one or multiple pictures for detailed viewing, and to copy/move pictures from one folder to the other. (NOTE: you may draw the interface for the viewer if you want.)

1. What principle would you choose to organize the pictures in folders?
2. How many windows would you have and what technique would you use to coordinate the operations between them?
3. How would you implement the copying/moving actions?

Discuss and explain your answers.

(Question 8: 12 points)

Identify three user-interface evaluation methods using usability experts. For each of these methods, discuss its process (what materials it requires and how it is carried out) and what are its advantages and disadvantages.

(Question 9: 10 points)

The forms below are taken from two web applications for travel planning. They differ slightly (a) on the exact task they enable the user to perform and (b) on the widgets they provide for interaction. Identify these differences and explain which form is better and why.

QUICK ROUNDTRIP FLIGHT SEARCH

Leaving from: Departing (MM/DD/YY) Time: 5/16/00 evening Travelers: 1 adult

Going to: Returning (MM/DD/YY) Time: 5/18/00 evening

This search is limited to adult roundtrip coach [search options...](#)

CURRENT HIGHLIGHTS

(Note: A dropdown menu is open for the 'evening' time slot, showing options: morning, afternoon, evening.)

Entertainment - Netscape

Home Search Netscape Print Security Shop Stop

http://travel.americanexpress.com/travel/personal/default.asp#speedy

Your Canadian Rockies Vacation

Air, Car, & Hotel Reservations

ITN/Ge by com

SPEEDY AIR SEARCH: Do a quick search for coach-class flights

Departing From: Start Date: Apr 25

Arriving In: End Date: Apr 25

Travelers: 1

Round Trip One Way

Advanced Search Options

(Note: A time selection dropdown menu is open, showing options from 12:00 am to 4:00 pm, with 'Morning' selected.)