

Instructor: Kenny Wong

Midterm

CMPUT 301 : User Interfaces and Software Design **A3**

October 11, 2000

Identification

Last Name: _____

First Name: _____

Student ID: _____

Instructions

Duration: 50 min

Weight: 15%

Read all the instructions.

The exam consists of 6 pages, including this cover page, and contains 4 questions worth a total of 30 points. The number of points assigned to each question is shown in square brackets. Please check that you have received a complete exam.

All questions are to be answered in this exam. This is an open-book, open-notes, but closed-neighbor :) in-class exam.

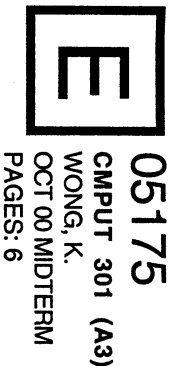
Use the backs of pages if necessary for additional working or answering space.

Start only when instructed. The time remaining will be written on the board and updated at about 5 min intervals.

Good luck!

Scoring

Question	Mark	Value
1		/6
2		/12
3		/6
4		/6
Total	_____	/30



Questions

1 [6] Inheritance

You have been hired by Chapters to save the company by reengineering their inventory system. They sell many kinds of media, including: audio tapes, books, calendars, compact discs, dictionaries, magazines, maps, newspapers, novels, posters, textbooks, and video tapes.

Draw a reasonable inheritance hierarchy using these items as specializations. Label the arcs and any generalizations clearly.

2

UML Design

One day, you decide to quit school and start a new company! Your first great idea is based on sophisticated remote-controlled webcams.

Each webcam may be panned, tilted, and zoomed to a number of user programmable coordinates. A number of webcams can be controlled and viewed through the internet by an application running on a handheld, wireless PDA.

As president, secretary, and the only employee, you must produce a good design for the system.

- (a) [6] Draw a plausible UML class diagram showing the abstractions, attributes, methods, associations, and generalizations for such a system. State any assumptions.

2

UML Design

- (b) [6] AOL is interested in your system and perhaps buying out your company! You stand to make millions, but they need more details.

Draw a plausible UML sequence diagram for a scenario to select a particular webcam, add a new preset coordinate location for it, and skew the webcam to that location.

3 [6] Task Analysis

Draw a hierarchical task decomposition (with tasks, subtasks, and plans) of the process of using an automated teller machine (ATM). Use a tree layout to represent the decomposition.

Focus only on how to deposit a cheque and how to withdraw cash from an account. Ignore other kinds of ATM transactions such as bill payments and balance queries.

4 [6] Java

Answer whether each of the following statements are true or false. Also, explain briefly.

- (a) _____ A Java interface may declare a constructor method signature.
- (b) _____ A Java interface can be completely empty.
- (c) _____ A class whose constructors are all private can still be instantiated.
- (d) _____ A class can directly extend any number of other classes.
- (e) _____ You can use the assignment `this = null` to destroy an object immediately.
- (f) _____ You can use the assignment `super = null` to turn off an extends relationship between two classes at runtime.