

Outline

1 final exam on Friday 8 August 2014

- general information
- policies for the first part

2 some example questions

- computer literacy terms
- mathematical computer science
- algorithm design
- modular design
- object-oriented design

MCS 260 Lecture 22.0
Introduction to Computer Science
Jan Vershelde, 6 August 2014

review of computer literacy

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general information

The exam will take place on Friday 8 August in 1200 SEO

- from noon till 2PM;
- with additional overtime of up to 10 minutes for late comers from other final exams.

If an emergency prevents you from participation, please contact me as soon as you are able to so we can schedule a makeup exam on Monday morning.

The final exam is comprehensive and covers the entire course, not just the part after the midterm exam.

Please review the posted answers to the midterm and the quizzes.

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policies for the first part

The first part of the exam will be closed book, no notes, and no computer.

The material breaks down in two parts:

- 1 computer science concepts: define a term, give an example, explain the difference.
- 2 mathematical CS: binary and hexadecimal representations of numbers, boolean algebra, truth tables, design of algorithms and programs via flowcharts, principles of good modular design, UML diagrams

This review contains some preliminary examples of questions which may help you prepare for the first part of the final exam.

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computer literacy terms

See the posted script `literacy.py`.

This script contains a dictionary of a bit more than 200 terms, organized according to each lecture.

The main function in the script pulls a term at random and as hint shows the lecture number where the term was explained.

Review: run the script and consult the lecture slides if needed.

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Please see the answers to the first midterm exam:

- binary and hexadecimal number system,
- logic expressions and truth tables.

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algorithm design

The Unix command `cal` produces a calendar as

```
$ cal 8 2014
      August 2014
Su Mo Tu We Th Fr Sa
                1  2
 3  4  5  6  7  8  9
10 11 12 13 14 15 16
17 18 19 20 21 22 23
24 25 26 27 28 29 30
31
```

Assume that this output of `cal 8 2014` is on file `cal`.

Design an algorithm that, given a number between 1 and 31, returns the day of the week.

For example, if the given number is 8, then `Fr` is returned.

- 1 Draw the flowchart for the algorithm.
- 2 Give pseudocode for the algorithm.

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design the modular structure

Design the modular structure of an online system to help planning a trip using public transport, for example with the CTA.

What is at the bottom of the program?

Describe the modules and their relations.

Refer to the three key principles of a good design to explain why you choose this design.

Start by thinking about only one subway or bus line.

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object-oriented design

Suppose we want to model a small online school.

All administrative functions are taken care of by a program.

Use UML to define

- class diagrams and
- use case diagrams

to model the administrative programs.

Students enroll in courses taught by faculty.

Faculty administer their courses: create, delete and enter grades.