Exam Details

CS370 Lecture 33 – April 3, 2017

Christopher's birthday edition

Reminder – A4

Assignment 4 is due today @4pm.

As usual, submit...

- analytical components, figures, & output to the physical assignment boxes in Math.

- code to the DropBox on Learn.

We'll try to get them back to you as soon as we can.

All other assignments/midterms will be with the TA's (after today).

Final Exam

Date/Time: Wednesday, April 12, 12:30pm-3:00pm.

Length: 2.5 hours.

Location: DC1350,1351

Divide into rooms by family/surname:

A-L will be in DC1350.
M-Z will be DC1351.

Final Exam – open book

The exam is **_open book,_** in the same manner as the midterm.

You may bring a non-programmable calculator, printed course notes, your own written/typeset lecture notes, assignments, & midterm.

No communication devices, programmable calculators, or other computation devices allowed.

Final Exam – format/coverage

There will likely be about 8 or 9 questions total.

Structure similar to the mid-term.

The exam **will** be cumulative: you are responsible for *all* the material we have seen so far, before and after the midterm.

There will be more emphasis on latter half, i.e. from FFTs on.

Expect a split of perhaps 2/3:1/3 or 70%:30%.

Exam Period Office Hours

Extra TA office hours will be posted on Piazza soon.

I will hold the following office hours:

Today, 1-2pm.

Friday 1-2pm.

Monday 1-2pm.

Tuesday 4-5pm.

QA Session

Prof Labahn will host another Question/Answer review/help session.

Monday, April 10, 7pm to <???> in DC 1351.

We hope to have A4's available by then.

Course Notes sections

You are responsible for:

- Section 1 (floating point)
- Section 2 (interpolation) except 2.6 and 2.7
- Section 3 (parametric curves)
- Section 4 (differential equations) except 4.5 and 4.8
- Section 5 (discrete Fourier transforms) except 5.13
- Section 6 (numerical linear algebra)
- Section 7 (Google PageRank)

Practice Q: Condition Numbers

Using our properties of norms...

- Why is it true that $\kappa(\alpha A) = \kappa(A)$?
- Why is it true that $\kappa(A) \geq 1$?

$$\lvert\lvert A \rvert\rvert = 0 \ \leftrightarrow \ A_{ij} = 0 \ \forall i, j.$$
$$\lvert\lvert \alpha A \rvert\rvert = \lvert \alpha \rvert \cdot \lvert\lvert A \rvert\rvert \ \text{ for scalar } \alpha$$
$$\lvert\lvert A + B \rvert\rvert \leq \ \lvert\lvert A \rvert\rvert + \lvert\lvert B \rvert\rvert$$
$$\lvert\lvert A\boldsymbol{x} \rvert\rvert \leq \ \lvert\lvert A \rvert\rvert \cdot \lvert\lvert \boldsymbol{x} \rvert\rvert$$
$$\lvert\lvert AB \rvert\rvert \leq \lvert\lvert A \rvert\rvert \cdot \lvert\lvert B \rvert\rvert$$
$$\lvert\lvert I \rvert\rvert = 1$$

Practice Q: Fourier transforms

Let $\{f_n\}, n = 0,1, \dots N - 1$, be N samples of a real signal with N even.

a) Show $W^{-nk} + W^{-(N-n)k} = 2 \cos\left(\dfrac{2\pi nk}{N}\right)$

(From course notes, section 5.14, Q1.)

Practice Q: Exploiting LU factorization

If you are given the LU factorization $A = LU$, how can you efficiently solve the linear system $A^T x = b$?

Thanks for a great semester, and good luck on the exam!