CSCI 334:
Principles of Programming Languages

Lecture 17: Graphics

Instructor: Dan Barowy
Williams

1

Your to-dos

1. Read *Evaluation* **before Thursday**.
2. Lab 9 (project checkpoint #1), **due Monday, April 29** (group project).

2

Final project timeline

1. Minimally working version (Lab 9), **due Mon 4/29**
2. Mostly working version (Lab 10), **due Mon 5/13**
3. Project + video presentation, **due Mon 5/20** (last day of exams)

Ward Prize nomination deadline: **May 6**

3

Announcements

- **Midterm exam**, in class, Thursday, May 2.
- Will hand out study guide on Thursday.
- Will devote part of class on Tuesday toward review.

4

Announcements

Class of 1960s Scholars Speaker: **Cynthia Dwork** (Harvard)

It's in Your Phone. It's in Your Browser. It's in Your Redistricting Data! ... It's Differential Privacy.

Why is privacy so slippery? Why is this a new problem? What is Differential Privacy, and what happened when Alabama sued to prevent its use in the 2020 Decennial redistricting data?

Groups, Individuals, Indistinguishability, and Loss: 15 years of Algorithmic Fairness in Under and Hour

Launched nearly fifteen years ago, the flourishing study of the theory of algorithmic fairness draws on cryptography, privacy, the philosophy of probability, machine learning, and complexity theory. In the spirit of the famous View of the World from 9th Avenue cartoon, we will map the area and describe one route through the terrain.

Cynthia Dwork, *Gordon McKay Professor of Computer Science at Harvard, and Affiliated Faculty at Harvard Law School and Department of Statistics, is renowned for placing privacy-preserving data analysis on a mathematically rigorous foundation. She has also made seminal contributions in cryptography and distributed computing, and she spearheaded the investigation of the theory of algorithmic fairness, her current focus. Dwork is the recipient of numerous awards including the IEEE Hamming Medal, the RSA award for Excellence in Mathematics, the Dijkstra, Gödel, and Knuth Prizes, and the ACM Paris Kanellakis Theory and Practice Award. Dwork is a member of the US National Academy of Sciences and the US National Academy of Engineering, and is a Fellow of the American Academy of Arts and Sciences and the American Philosophical Society.*

5

Topics

Graphics

6

(code)

7

The grammar for this language is:

<expr> ::= <line> <expr> | repeat <n> <line> <expr> | <empty>
<line> ::= <color> line
<n> ::= (any positive integer)
<color> ::= red | green | blue | purple

Recap & Next Class

Today:

Graphics

Next class:

Variables

8