CS 111: Program Design I

Lecture 20: Exam Review

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Election Day, 2019 (but not in IL)

REVIEW: LIMITATIONS OF LEGAL ANALYSIS WITH DATA ANALYTICS

Accurate Prediction

Predictive data analysis (predictive analytics) is rather poor at prediction generally.

Because it leaves out context.

Useful Inaccuracy

- So when is it useful?
  - When humans are even worse at prediction, and
  - There is significantly increased benefit from improved prediction accuracy, and
  - COSTS of False positives and false negatives are low.

Computer Fraud and Abuse Act

- Criminal and civil liability for whoever **(a)** “intentionally accesses a computer **(b)** without authorization . . . , and **(c)** thereby obtains ... information from any . . . computer.” 18 U.S.C. § 1030(a)(2)(C).”
    - This is enough for intentional access:
        - page = ur.urlopen(url)
    - Viewing information is “obtaining” it. This obtaining information:
        - start = page.read ()

Code, Copyright, and Contracts

```
import urllib.request as ur

page = ur.urlopen(url) # CFAA, contracts
start = page.read () # copyright, contracts
```

Copyright: A Bundle of Rights

- The right to
  - make copies and distribute copies of the work.
  - make a derivative work.
  - publicly display the work
  - publicly perform the work
- 17 U. S. C. § 106.

Contracts and Good Faith

- If you have an adequate opportunity to read and understand an agreement, the law treats you as if you read and understood even if in fact you did not do so.
- The obligation of good faith limits the enforceable terms in such contracts.

REST OF OUR REVIEW FOR EXAM

Today

- Review for exam
- If time / lack of review questions from you all, more on HTML

Exam II

- Cumulative, but much heavier emphasis on material from last 5–6 weeks

General CS topics

- Computers, algorithms, Moore's law, etc., from very beginning of course
- Software design, hierarchical decomposition
- Writing code that humans can read
- Notion of data analytics / data science

General legal topics

- Compelled disclosure of crypto keys
- CFFA and use of websites
- Use of data analytics instead of or in addition to expert analysis in law in general, in understanding court decisions in particular

Python programming concepts

- **Writing larger programs**
  - functions, def, etc.
- Variables, Data, and variable/data types
- simple if and else
- **for/while/if with elif or nesting**
  - basics of break and continue
- **Modules**
  - Very simplest basics of pandas

Python programming (cont.)

- Strings
- type conversion
  - i.e., int('12') → the integer 12
- ***Lists***, including mutability, methods
- **Files**

Review questions

- Exam will have few (maybe even zero) multiple choice questions, but many clicker questions now to get everybody's involvement

What is printed?

```
ls = [2, 4, 6, 8, 10]
foo = ls.pop(2)
bar = ls.pop()
print(ls)
```

A. [2, 6, 8]

B. [4, 8, 10]

C. [2, 4, 8]

What is printed?

```
ls = [2, 4, 6, 8, 10]
ls = ls.pop()
print(ls)
```

A. `[2, 4, 6, 8]`
B. `[2, 4, 6, 8, 10]`
C. `10`
D. `[2, 4, 8]`
E. `None`

What is printed?

```
ls = [2, 4, 6, 8, 10]
b = [ ]
for item in ls:
    b.append(item+5)
print(b)
```

A. `[2, 4, 6, 8, 10]`

B. `[2, 4, 6, 8, 10, 10]`

C. `[7, 9, 11, 13, 15]`

D. Error; the + inside append causes an issue

In Python a module is:

A. A file containing Python definitions and statements intended for use in other Python programs

B. A separate block of code within a program

C. One line of code in a program

D. A file that contains documentation about functions in Python

Which statement allows you to use the random module in your program

A. `import random`

B. `include random`

C. `use random`

D. Since random is in the standard library, you don't need any statement

What happens?

```
x = -42
if x < 0:
    print("The negative number ", x, " is not valid here.")
else:
    if x > 0:
        print(x, " is a positive number")
    else:
        print(x," is 0")
```

A. The negative number…

B. is a positive number ...

C. is 0 ...

D. Error

A variable pi is in the math library. Assuming you have imported math, how do you refer to pi?

A. `math.pi`

B. `math(pi)`

C. `pi.math`

D. `math->pi`

Which modules would you most likely need if you needed to simulate rolling dice and do data analytics?

A. math

B. random

C. pandas

D. pandas and math

E. pandas and random

Write a function that returns the sums of all the negative numbers in a list of numbers

write a function

- That sums up all the numbers in a list of integers up to but not including the first odd number

Grades to letter

- Write a function that takes as input a number that is understood as a score out of 100 and returns a length-1 string containing a letter grade according to the conventional scale: 90 or above is an A, 80 or above is a B, 70 or above is a C, 60 or above is a D, below 60 is F.