

# CS 100: Final Exam Review

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Week 14

# Logistics

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Week 14	Tue 5/2 Thu 5/4	Automation Review HW 6 Due
Week 15	Thu 5/11	Final Exam 10:30am-1:15pm

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- ▶ Informal Evals
- ▶ Formal Evals at end
- ▶ HW6 Questions?

# Final Exam

- ▶ Thursday 5/11
- ▶ 10:30am-1:15pm
- ▶ In Normal Lecture Room
- ▶ Worth 20% of your grade
- ▶ Open resource exam, review rules
- ▶ Expect about 6 pages of work
- ▶ Mini-exam style questions
- ▶ 1 half to full page essay question
- ▶ Comprehensive

# Final Exam Topics

See the full list on [the schedule](#)

- ▶ Bit representations of stuff
- ▶ Notion of an algorithm
- ▶ Basic Python programming
- ▶ Basic HTML code
- ▶ How the Internet works
- ▶ Encryption basics and limitations
- ▶ Basics of random number generation
- ▶ Parallel computation strengths and weaknesses
- ▶ How to compress digital stuff
- ▶ Simulations and their limitations
- ▶ Basics of machine learning, examples
- ▶ Effects of automation on human society

# Sample Exam Problems

## Easy Python Loop

Write a python function that prints 3,6,9,12,... up to a limit specified by the user.

## HTML

- ▶ Create HTML that has an unnumbered list of five fruits.
- ▶ Create a paragraph of text with a link to <http://google.com> with the link text "you will be assimilated"

## Social Impact

Give an example of how the Internet has changed the way humans work. Describe the positive and negative impacts on humans of your example.

# Sample Exam Problems

## Encryption

Explain the difference between Symmetric Encryption algorithms like the Caesar Cipher and Asymmetric Encryption techniques such as those used to do secure online transactions.

## Security

- ▶ Describe some things to look for in email messages that might indicate that they are scams
- ▶ Describe some important things to look for when visiting a new site to ensure that it is legitimate and not a phishing site.

## Graphics

Describe two fundamentally different ways to encode graphics and pictures using bits. Discuss a few advantages of both formats such as scalability of the graphics. List a few common file types associated with both types of graphics files

## A Problem on Bit Representation

**Taste** is one of the central senses of most animals. Biologically, many flavors can be broken into 5 basic tastes: sweetness, sourness, saltiness, bitterness, and umami. This is similar to breaking colors into their constituent components as was discussed in a HW so that a light-emitting device can recreate a color by combining its components. The relative "levels" of fundamental tastes contribute much to the overall flavor of a food. Describe a way to encode various tastes using bits so that a theoretical "flavor-emitting" device could combine the 5 fundamental tastes to create different flavors. Describe specifically how each part of the bit string would be used to convey the overall flavor.

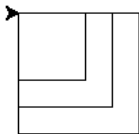
## A Python Problem from a previous final

Write a python function

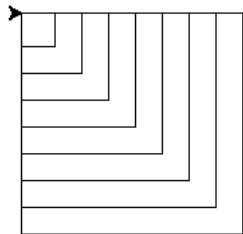
```
draw_concentric_squares(first_size,total_squares)
```

- ▶ Draw a square of the size given in the parameter `first_size`
- ▶ Draw another square 20 pixels bigger with the same position for the upper left corner.
- ▶ Continue drawing additional larger squares, each 20 pixels larger than the last, until `total_squares` have been drawn.

```
draw_concentric_squares(50,3)
```



```
draw_concentric_squares(25,8)
```





## And Another Python Problem

Write a python function `biggest_even(number_list)`

- ▶ Determines the largest even number in a list `number_list`
- ▶ All numbers in `number_list` assumed positive
- ▶ If no even numbers in `number_list`, return `-1`

```
num_list = [2,8,4,16,6]
be1 = biggest_even(num_list)
# 16 is largest even
```

```
num_list = [2,8,4,15]
be2 = biggest_even(num_list)
# 8 is largest even
```

```
num_list = [1,3,5]
be3 = biggest_even(num_list)
# -1 : list has no evens
```

# Formal University Evals

- ▶ Put finished surveys in Red Envelope
- ▶ Volunteer to collect and deliver to Johnson Center?