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Optional: name of "homework buddy" (leaving this blank signifies "I worked alone")	

# 1

# h05

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## h05: Unix File Permissions and Octal, Perkovic 7.1 (Encapsulation, Stack Frames), Review for final

ready?	assigned	due	points
true	Tue 09/04 09:30AM	Tue 09/11 09:30AM	250

You may collaborate on this homework with AT MOST one person, an optional "homework buddy".

MAY ONLY BE TURNED IN IN THE LECTURE/LAB LISTED ABOVE AS THE DUE DATE.

There is NO MAKEUP for missed assignments, and you may not submit work in advance, or on behalf of another person.

In place of that, we drop the lowest score (if you have a zero, that is the lowest score.)

### READING ASSIGNMENT

Please review octal numbers and Unix file permissions, or consult this web page:

[https://ucsb-cs8.github.io/topics/number\\_conversions/](https://ucsb-cs8.github.io/topics/number_conversions/)

Then complete these problems:

1. Please fill in the information at the top of this homework sheet, including your name and uemail address. If the other two items apply, please fill them in as well. Please do this every single time you submit homework for this class. It is important to fill in both name and uemail every time, since handwriting is sometimes difficult to decipher. Having both helps us ensure you get credit for your work.

You can also edit the pdf (or scan your written work after printing the pdf), and upload your homework to Gradescope instead of turning it in during class.

Also: JUST write your name at the top of all sheets and turn in all sheets UNCONNECTED.

DO NOT staple, paper clip, spit-fold-and-tear, or do ANYTHING that would make it difficult to automatically feed your paper through a scanner.

2. (10 pts) What is the Unix command to list your files in a way that shows the unix file permissions with strings such as `rwxr-xr-x`?
3. (10 pts) If there is a Unix file in my current directory called `index.html` and I want to set its permissions to `rw-r--r--` what Unix command will do that? (The full command, not just the first word of the command).

Please complete each of the conversions shown. You can practice at the page:

<https://www.cs.ucsb.edu/~pconrad/cs8/topics/chmodQuiz1/> until you are confident that you know how to solve these.

4. (10 pts) Convert `rwxr-x---` from `rwX` format to octal:
5. (10 pts) Convert `rwxr-xr-x` from `rwX` format to octal:
6. (10 pts) Convert `777` from octal to `rwX` format:
7. (10 pts) Convert `rwXrwX---` from `rwX` format to octal:
8. (10 pts) Convert `600` from octal to `rwX` format:
9. (10 pts) Convert `444` from octal to `rwX` format:
10. (10 pts) Convert `rwX--X--X` from `rwX` format to octal:

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**READING ASSIGNMENT** Please read Perkovic 7.1 (Encapsulation, Stack Frames). Then complete these problems.

11. The second half of Section 7.1 discusses Stack Frames. Two things that can happen with a stack frame are a “push” event and “pop” event.
- a. (5 pts) What event in a running Python program is associated with the “push” of a stack frame onto the stack?
  - b. (5 pts) What event in a running Python program is associated with the “pop” of a stack frame from the stack?

12. Section 7.1 discusses three of the most important benefits of using functions:

- *reuse*
- *modularity*, also called *procedural decomposition*
- *encapsulation* also called *information hiding*

Below are some things that a programmer might say about one of the functions in the example code in the book. Indicate by circling, which benefit of functions is illustrated by the quote. Then, justify your answer with a brief explanation.

That explanation should pertain *specifically* to the code shown, and *NOT* simply be a restatement of the definitions of the terms from the textbook, or “copy/paste” verbatim quote from the textbook.

(Note it is possible there may be more than one reasonable choice among the three benefits. Choose one and support it, or circle more than one, and explain why you feel more than one applies.)

a. (20 pts)

The `emoticon` function (p. 204) can be used to draw an emoticon in the following program. The programmer doesn’t even need to know how the emoticon is drawn.

```
import turtle
from turtlefunctions import emoticon
fred=turtle.Turtle()
emoticon(fred,50,50)
```

Reuse            Modularity            Encapsulation

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b. (20 pts)

The `emoticon` function (p. 204) can be used to draw three emoticons on the screen of three different colors, like this:

```
import turtle
from turtlefunctions import emoticon
fred=turtle.Turtle()
fred.color("red")
emoticon(fred,-150,100)
fred.color("blue")
emoticon(fred,150,100)
fred.color("green")
emoticon(fred,0,-100)
```

Reuse

Modularity

Encapsulation

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c. (20 pts)

In a blackjack program, instead of writing this code to deal one card to the player, and one card to the house:

```
card = deck.pop()
player.append(card)
card = deck.pop()
house.append(card)
```

We can write this code:

```
dealCard(deck, player)    # deal to player first
dealCard(deck, house)    # deal to house second
```

Reuse

Modularity

Encapsulation

Using the function:

```
def dealCard(deck, participant):
    'deals single card from deck to participant'
    card = deck.pop()
    participant.append(card)
    return card
```

These problems are review for the final exam, and refer to material from Chapters 2-6, and section 7.1

13. (20 pts) Write a python function definition `count_ae` that takes one parameter `s` and returns 0 if `s` is not a string, otherwise returns the number of occurrences of `a` and `e` in that string (only lowercase). For example:

- `count_ae(-42)` should return 0
- `count_ae("Santa Ynez")` should return 3
- `count_ae("Santa Ana")` should return 3 (the uppercase A does not count)

14. (10 pts) Write two test cases in the `pytest` style for `count_ae`

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15. For each of the problems below, write a python functions with the name indicated that takes one parameter called `aList`, or test cases for those functions (in the style of `pytest`). In each case, you may assume `aList` is of type `list` and that all values in `aList` are of type `int`, and that `aList` contains at least two elements. For these problems, you don't need to check those things.

Your code may not modify the list in any way. If you want to make a sorted copy of the list as a local variable, you may use this code:

```
sortedCopy = aList[:].sort()
```

- a. (10 pts) `minValue`, which returns the minimum value in the list *without* using the built-in function `min`.
- b. (10 pts) Two test cases (in the `pytest` style) for `minValue`
- c. (10 pts) `avgValue` which returns the average value of the elements in the list. You may any built in functions available in Python, or compute the sum using the accumulator pattern (your choice).
- d. (10 pts) Two test cases (in the `pytest` style) for `avgValue`
- e. (10 pts) `secondSmallest` which computes the second smallest element in the list (not the second smallest value). For example, `secondSmallest([3, 7, 3])` should return 3.
- f. (10 pts) Two test cases (in the `pytest` style) for `secondSmallest`