CS 150
Practice Exam 2

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Task 0: Linux (10 points)

Move into your *cs150* directory and create a directory named *practice2*. Now, move into *practice2* and create five subdirectories named *yksi*, *kaksi*, *kolme*, *nelja*, and *viisi*.

Task 1: Interactive input (10 points)

Move into the *yksi* directory. You are to write a complete program that obtains three pieces of data and then process them. The three pieces of information are a Boolean value, a string, and an integer. The logic of the program is this: if the Boolean value is `True`, print out the string twice, once with double quotes and once without – otherwise print out twice the number.

Remember to covert your Boolean and numeric input from strings; you can use the *eval* and *int* functions, respectively. Also, you can print out a quote character like this:

```
print("\"")
```

or like this:

```
print('"')
```

Use the *input* function to query the user of your program for the three pieces of data. Name your program *interactive.py*. Here is an example of how your program should behave:

```
ubuntu@ubuntu:~/cs150/io$ python3 interactive.py
Give me a Boolean: True
Give me a string: how now brown cow
Give me a number: 13
how now brown cow
"how now brown cow"

ubuntu@ubuntu:~/cs150/io$ python3 interactive.py
Give me a Boolean: False
Give me a string: how now brown cow
Give me a number: 13
26
```

Task 2: Command-line input (20 points)

Move into the *kaksi* directory. Use command-line input to obtain the same data as in Task 1. Name your program *command.py*. Here is an example of how your program should behave:

```
ubuntu@ubuntu:~/cs150/io$ python3 command.py True "how now brown cow" 13
how now brown cow
```

```
"how now brown cow"

ubuntu@ubuntu:~/cs150/io$ python3 command.py False "how now brown cow" 13
26
```

Task 3: Scanner input (20 points)

Move into the *kolme* directory. Use the Scanner to obtain the data from a file named *info.dat*. Name your program *file.py*. If the file *info.dat* contains the text:

```
True "how now brown cow" 13
```

Your program should behave this way:

```
ubuntu@ubuntu:~/cs150/io$ python3 file.py
how now brown cow
"how now brown cow"
```

If the file *info.dat* contains the text:

```
False "how now brown cow" 13
```

Your program should behave this way:

```
ubuntu@ubuntu:~/cs150/io$ python3 file.py
26
```

You can get the Scanner with the command:

```
wget troll.cs.ua.edu/cs150/projects/scanner.py
```

Note, the Scanner's *readstring* function reads a string delimited by double quotes. The quotes are left in the string that is returned. To remove them, use a slice, as in:

```
#s is a scanner object
str = s.readstring()
str = str[1:-1]
```

Task 4: Functions (20 points)

Move into the *nelja* directory. Write a program, named *function.py*, whose *main* function takes in three integers using the input function. It then passes those three numbers to a function called *max3*. This function returns the maximum of those three numbers. The *main* function then prints the result returned by *max3*.

Here is an example:

```
$ python3 function.py
Give me a number: 4
Another: 8
Another: 3
The max is 8
```

Task 5: Scope (20 points)

Move into the *viisi* folder. Consider the program:

```
# scope 1
def fillOrder(flower, count):
    # scope 2
    work = "Preparing " + str(count) + " " + flower + "(s)."
    print(work)

name = "Ye Olde Flower Shoppe"
months = 60

def openStore(prop):
    # scope 3
    def toYears(m):
        # scope 4
        years = m // 12
        return years
    print(prop,"opened the",name,toYears(months),"years ago.")

def main():
    # scope 5
    proprietor = "Chris Mumm"
    openStore(proprietor)
    first = "bouquet"
    num = 20
    fillOrder(first,num)
    second = "corsage"
    num = 15
    fillOrder(second,num)
    answers()
```

Create a file named *answers*. In it, place the following questions along with the correct answers:

- In what scope or scopes is variable *flower* visible?
- In what scope or scopes is variable *name* visible?
- In what scope or scopes is variable *num* visible?
- In what scope or scopes is variable *m* visible?
- In what scope is variable *work* defined?
- In what scope is variable *toYears* defined?
- In what scope is variable *openStore* defined?
- What variables are visible in scope 1?
- What variables are visible in scope 2?
- What variables are visible in scope 4?
- Is there a single scope where all the variables are visible?

Submitting your exam

While in the `~/cs150/practice2` directory, run the *du* command again:

```
du -a
```

You should see the output:

```
8 ./yksi/interactive.py
4   ./yksi
4   ./kaksi/command.py
4   ./kaksi
4   ./kolme/info.dat
4   ./kolme/file.py
4   ./kolme
4   ./nelja/function.py
4   ./nelja
4   ./viisi/answers
4   ./viisi
128 .
```

The numbers and orders do not matter, but you should not have any extra files listed. Now submit your exam as an activity:

```
exam cs150 YYY practice2
```

where YYY is your section number.