PRACTICE EXAM # 1   Name: _____
Covers Material From Weeks 1 through 4: Jan 22nd - Feb 9th
CS 151: Spring 2020
Lab Instructor:

Instructions:
Please answer the questions below. This is an assessment so no materials or help from others is allowed. THIS IS A PRACTICE EXAM - THE REAL EXAM WILL HAVE FEWER QUESTIONS

1   Give the value and type for the following

Problem 1. (14 points) Consider the following Python expressions. Give the type and value returned by the following statements (1 point for correct type and 1 for correct value):

(a) 14

   int, 14

(b) 3∗4

   int, 12

(c) [1,2,"a",4]

   list, [1,2,"a", 4]

(d) "10"+"text"

   string, "10text"

(e) 1 > 6 and 1 == (2 − 1)

   Boolean, False

(f) [1,2,"a",4][1]

   int, 2

(g) {"jane":"password!","jose":"12345","magik45":"secretpw"}["jose"]

   string, "12345"

2   What do the following statements print?

Problem 2. (5 points)

```
x = 3
y = 4
print(str(y)+str(y))
```

Solution:

44

Problem 3. (5 points)

```
x = 3
y = 4
print(str(x+x+y))
```

Solution:

10

Problem 4. (5 points)

```
for i in range(3):
    print(i)
```

Solution:

0
1
2

Problem 5. (5 points)

```
x = 1
while x <= 12:
    x = 4*x
    print(x)
```

4
16

Problem 6. (5 points)

```
x = 1
while x <= 12:
    print(x)
    x = 4*x
```

Solution:

1
4

Problem 7. (5 points)

```
n = 0
a = 5
b = 2
c = 4
if a > 3:
    n = n + 1

if a > 3 and c < 4:
    n = n + 3

if b > 6 and c < 4 or c <= 9:
    n = n + 5

print(n)
```

Solution:

6

Problem 8. (5 points)

```
some_text = "Mary␣"
some_text += "had␣a␣little␣"
some_text += "lamb"
print(some_text[0])
print(some_text[2])
print(some_text[4])
print(some_text[-3])
```

Solution:

M
r
(space)
a

Problem 9. (5 points)

```
st = ["whose"]
st += ["fleece", "was"]
print(st[0])
```

```
print(st[2])
print(st[-2])
```

Solution:

Whose
was
fleece

Problem 10. (5 points)

```
def sheep(x):
    for i in range(x):
        print("baa!")

for i in [2,1]:
    sheep(i)
```

Solution:

Baa!
Baa!
Baa!

Problem 11. (5 points)

```
def duck(x,y):
    sound = ""
    for i in range(x, y):
        sound = sound + "Quack! "
    return sound

print(duck(2, 3))
```

Solution:

Quack!

3 Find the syntax errors.

Problem 12. (5 points)

```
# This code prints Hello World
print(Hello World)
```

Solution:

Missing quotes around text to be printed.

Problem 13. (5 points)

```
# This program is supposed to get a temperature from the user
# in Celsius and print the conversion to Fahrenheit.
ans = "y"
while (ans = "y") or (ans = "Y"):
c = input("Enter temperature: ")
f = (9/5)*c + 32
ans = input("Do you want to perform another conversion? ")
```

Solution:

single = for comparison but should be ==.
Code to be executed in while loop not indented.
Can't multiply 9/5 by c because c is a string.
Note: this code doesn't do what the comment claims. There is no print(f). That is a logic error though, not a syntax error.

4   Find the logic errors.

Problem 14. (5 points)

```
# This program is supposed to print the squares of 1 through 5
# i.e. 1 4 9 16 25
i = 0
while i < 5:
    print(i*i)
    i += 1
```

Solution:
Starts at zero instead of one (or should print after i incremented).
Loop ends before it gets to 5, should be <=.

Problem 15. (5 points)

```
# This function returns the product of the integers between start and end
# For example, multrange(2,4) returns 2 x 3 x 4 = 24
def multrange(start, end):
    total = 0;
    for i in range(start, end+1):
        total = total*i
```

Solution:

5 Write code to solve the following problems

Problem 16. (5 points) The formula for the area of a parallelogram is base $\times$ height. Write a function that returns the area of a parallelogram given its base and height.

Solution:

```python
def parallelogram_area(base, height):
    return base*height
```

Problem 17. (5 points) The area of a triangle is $\frac{1}{2}$base $\times$ height. Assume that the function you wrote for the area of a parallelogram works. Use that function to write another function that returns the area of a triangle.

Solution:

```python
def triangle_area(base, height):
    return parallelogram_area(base, height)/2
```

Problem 18. (5 points) Write a function that reverses any string given as an argument. For example: "string" becomes "gnirts".

Solution:

```python
def reverse_str(text):
    reversed_text = ""
    length = len(text)
    for t in range(1,length+1):
        reversed_text += text[length-t]
    return reversed_text
```

Problem 19. (5 points) Assume your string reversal function works. Show how you would use your string reversal function to write a palindrome detector function that returns True when the text it is given is a palindrome. A palindrome is a word that is the same when read backwards as forwards. For example "racecar" is a palindrome, "racecars" is not.
Solution:

```python
def check_palindrome(text):
    return reverse_str(text) == text
```