

COSC 101, Practice Problems Midterm Exam #1

September 2024

1. (9 points) Assume that the following statements have already been executed:

```
x = 4040
y = "1313"
z = 10.8
s = ["cats", "gnome", 2, 1, -1, "dog", "colgate"]
```

For each of the following expressions, evaluate the expression and write the resulting value, or describe the error in the code that would prevent it from running.

- (a) `x / 10 ** 2 // len(y)`

Solution:

10.0

- (b) `int(z) * x + 1`

Solution:

40401

- (c) `x+y`

Solution:

`TypeError: unsupported operand type(s) for +: 'int' and 'str'`
(Runtime error is OK too)

- (d) `x % 100 + 1`

Solution:

41

- (e) `s[-1] + '.' * 4 + y`

Solution:

```
'colgate....1313'
```

(f)

```
for i in range(4, -13, -3):  
    print(i)
```

Solution:

```
4  
1  
-2  
-5  
-8  
-11
```

(g)

```
x + z = x
```

Solution:

```
Syntax error
```

2. (8 points) Assume that the following statements have already been executed:

```
x = 3
y = "4"
z = 8.4
s = "Raiders"
```

For each of the following expressions, evaluate the expression and write the resulting value, or describe the error in the code that would prevent it from running.

(a) `x ** (z // x)`

Solution:

9.0

(b) `y + x * str(x)`

Solution:

'4333'

(c) `s[7]`

Solution:

IndexError: string index out of range

(d)

```
for i in range(0, 18, 3):
    print(i)
```

Solution:

```
0
3
6
9
12
15
```

(e) `'o' * x + y`

Solution:

'ooo4'

3. (4 points) Consider this program:

```
def foo(words: list) -> str:
    print(words)
    return words[0]

def main():
    wordlist = ['Happy', 'birthday', 'to', 'you!']
    y = foo(wordlist)
    print(y)
    foo(['1', '2', '3'])
    print(y)
```

main()

(a) (4 points) What will the output of the program be?

Solution:

```
['Happy', 'birthday', 'to', 'you!']
Happy
['1', '2', '3']
Happy
```

4. (5 points) Consider this program:

```
def main():
    word = input("Enter a word: ")
    number = int(input("Enter a positive integer: "))
    result = ""
    for i in range(3):
        print(i)
        index = i * number
        print(index)
        result = result + word[index]
        print(result)
    print(result)
```

main()

What will the output of the program be assuming the user enters holidays and 3?

Solution:

```
0
0
h
1
3
hi
2
6
hiy
hiy
```

5. (4 points) What is the output of the following program?

```
def function(b:str) -> str:
    a = b * 2
    b = b + 'corn'
    print(f"A = {a}")
    return b
```

```
def main() -> None:
    a = 'corn'
    b = 'candy'
    b = function('pop')
    print(f"a = {a}")
    print(f"b = {b}")
```

```
main()
```

Solution:

```
A = poppop
a = corn
b = popcorn
```

(This page is intentionally blank. Label any work with the corresponding problem number.)

6. (10 points) Write a function called `print_pattern` that takes in a positive integer n and prints a pattern of hyphens (-) and asterisks (*).

For example, for $n = 4$, the function must print:

```
---*
--**
-***
****
```

Similarly, for $n = 5$, the function must print:

```
----*
---**
--***
-****
*****
```

Note that the total number of rows printed by the pattern must be equal to n . You do not need to provide a `main` function. You must use `for` loop.

Solution:

```
def print_pattern(n: int) -> None:
    for i in range(1, n + 1):
        pattern = '*' * i
        pattern2 = '-' * (n - i)
        row = pattern2 + pattern
        print(row)
```


7. (8 points) Write a function called `print_name` that takes in the name of the user and prints a special greeting for them. This special greeting will say hi to the user multiple times, depending on how long their name is. Also, the number of letter 'i's in the word 'hi' and '!'s at the end will increase for each additional line. Your function's output should match these examples:

```
What is your name? Bob
Hi Bob!
Hii Bob!!
Hiii Bob!!!
```

```
What is your name? Mary
Hi Mary!
Hii Mary!!
Hiii Mary!!!
Hiiii Mary!!!!
```

Solution:

```
def print_name(name: str) -> None:
    for x in range(len(name)):
        # compute number of 'i' and '!' to print
        count = x + 1
        # print the line (using string copies)
        print(f"H{'i'*count} {name}{'!'*count}")

def main() -> None:
    # get name from user
    name = input("What is your name? ")
    print_name(name)

main()
```