Quiz 01 Practice

COMP 110: Introduction to Programming
Fall 2025

Wednesday, September 17, 2025

Question 1: Respond to the following questions. If a line of code is unreachable, write "N/A."

Consider the following code listing:

```
1 def get_gift(budget: int) -> str:
2   """Returns a gift idea based on a budget."""
3   if budget > 0:
4     return "A gift!"
5   else:
6     if budget >= 110:
7       return "Nice dinner"
8     else:
9       return "Unreachable?"
```

1.1. Write a function call expression to the ~~get_gift~~ function that evaluates to `"Unreachable?"`

get_gift(budget = -1) (or any other negative int!)

1.2. Write a function call expression to the `get_gift` function that evaluates to `"Nice dinner"`

N/A; unreachable

1.3. Write a function call expression to the ~~get_gift~~ function that evaluates to `"A gift!"`

get_gift(budget = 10) (or any other positive int!)

1.4. Rewrite lines 3-9 of the code listing to eliminate unreachable code (if any) and the nested if-else statement. Your code should behave exactly as lines 3-9 of this code listing do; for any value of budget, your code should return exactly what lines 3–9 of the listing would return.

```
if budget > 0:
    return "A gift!"
else:
    return "Unreachable?"
```

Question 2: Memory Diagram Trace a memory diagram of the following code listing.

```
1  def jump(word: str) -> str:
2    i: int = len(word) - 1
3    while i >= 0:
4      if i % 2 == 1:
5        print(word[i])
6      else:
7        print(i)
8      i = i - 1
9    return word[0]
10
11
12 jump(word="play")
```

Output

```
Y
2
l
0
```

Stack

Globals

jump | id:0

Heap

id:0 fn lines 1-9

jump

RA | 12

word | "play"

RV | "p"

i | ~~3~~ ~~2~~ ~~1~~ ~~0~~ -1

Note that i will have a final value of -1, which will allow us to stop looping / iterating through the while loop!

Question 3: CHALLENGE: Recursive Function Definition Writing Write a recursive function definition that returns the sum of all positive, even integers less than or equal to a given `int`. Your function definition should meet the following expectations:

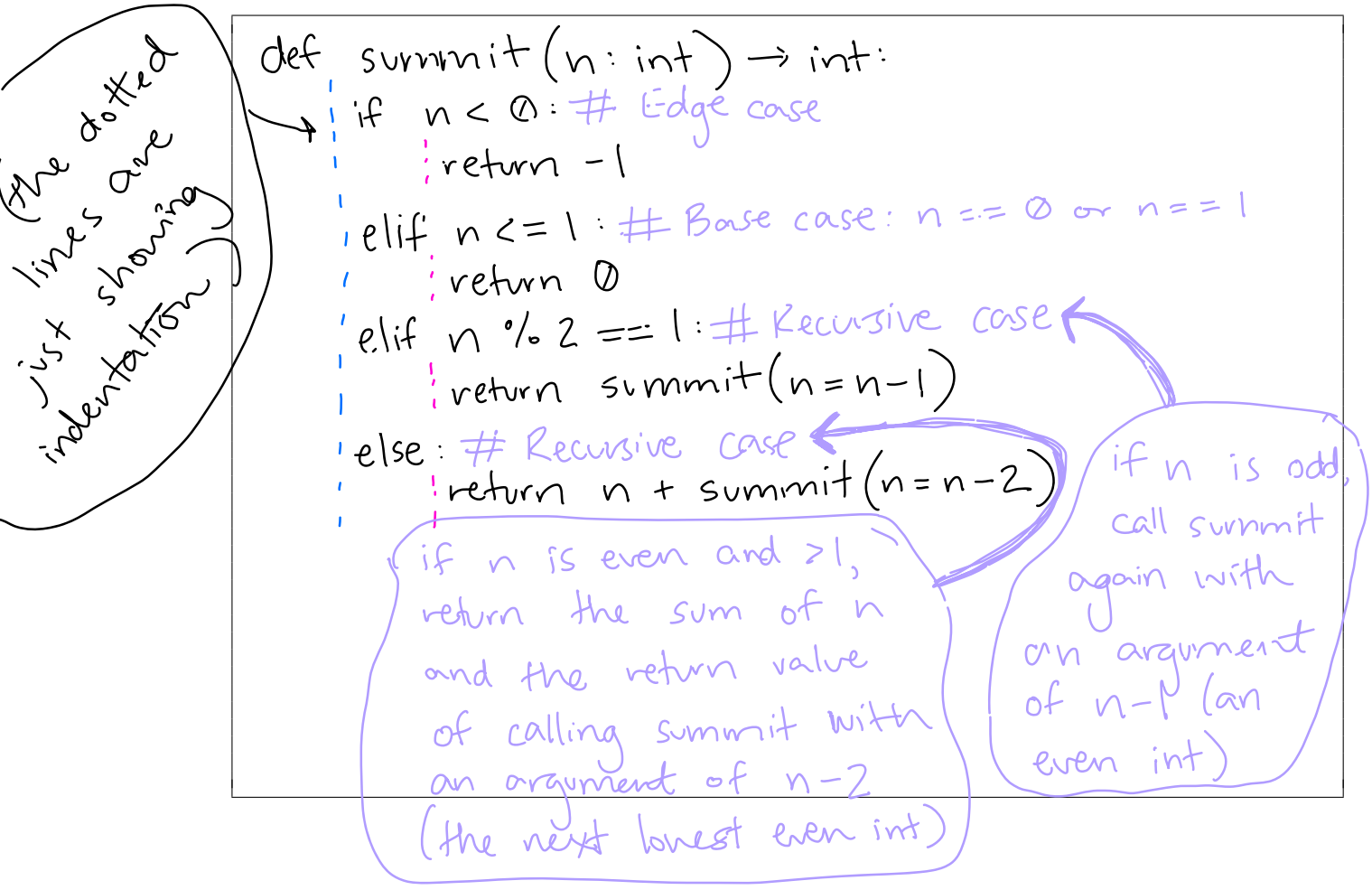
- The function should be named `summit`, have one `int` parameter named `n`, and return an `int`.
- If `n` is negative, the function should return `-1`.
- If `n` is positive, the function should return the sum of all positive, even integers less than or equal to `n`.
- Explicitly type your parameters and return types.
- Label your base case(s) and recursive case(s).

The following REPL examples demonstrate the expected functionality of your `summit` function:

```
>>> summit(-2)
-1
>>> summit(1)
0
>>> summit(2)
2
>>> summit(3)
2
```

```
>>> summit(4)
6
>>> summit(5)
6
>>> summit(6)
12
>>> summit(12)
42
```

3.1. Write your function definition here:



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Good luck on Friday! :)