

QUIZ 01 PRACTICE QUESTIONS

Booleans and Conditionals

1. What values of x and y would cause the following expression to evaluate to True?

$$x \% 3 == 2 \text{ and } y < 10 \text{ and } x + y == 15 \text{ and } y \% 2 != 0$$

2. Write the boolean value each expression evaluates to:

- i. $(8 * 3) == (50 \% 6 * 12)$
- ii. $((\text{not false}) \text{ and } \text{true}) == \text{true}$
- iii. $(\text{not false}) \text{ or } (\text{true and false})$
- iv. $\text{true and } (7 < 3 * 4 / 6)$
- v. $\text{not}(4 < 10 \text{ or false}) != \text{true}$

3. With the following code snippet, what output will appear on the screen when each of the following values is used for x and y?

- i. When x = 3, y = 5?
- ii. When x = 5, y = 3?
- iii. When x = -5, y = 1?
- iv. When x = 13, y = 8?
- v. When x = 4, y = 3?

```
x = x - 1
if x < y:
    z = x ** y / 2
else:
    if x == y:
        z = y % x
    else:
        x = x / 2
        z = y - x
z = z + 1
print(z)
```

Functions

1. **Animal noise:** Produce a memory diagram of the following code listing, including stack, heap, and output.

```
1  """A program which produces some animal noises."""
2
3  def main() -> None:
4      """Entrypoint of program."""
5      x: int = 2
6      sound: str = animal_noise(foo(x))
7      print(animal_noise(x + 3))
8      print(sound)
9
10
11 def animal_noise(x: int) -> str:
12     """A silly function that returns animal noises."""
13     if x < 7:
14         if x < 5:
15             print("the mouse goes")
16             return "squeek"
17         else:
18             print("the cow goes")
19             return "moo"
20     if x < 10:
21         print("the cat goes")
22         return "meow"
23     return "woof"
24
25
26 def foo(y: int) -> int:
27     """A silly function."""
28     result: int = y + 1
29     return y * 2
30
31
32 if __name__ == "__main__":
33     main()
```

2. **Nested FUNctions:** Produce a memory diagram of the following code listing, including stack, heap, and output.

```
1  """A program to do some silly math."""
2
3  def f(x: int, y: int) -> int:
4      """A weird function."""
5      if x + y > 10:
6          print("howdy!")
7          return x
8      else:
9          return x + y
10
11
12 def g(x: int) -> int:
13     """Another weird function."""
14     if x % 2 == 0:
15         print("it's even")
16         x = x + 1
17     else:
18         x = x * 2
19     return x
20
21
22 def bar(x: int, y: int) -> int:
23     """Yet another weird function."""
24     if x > y:
25         print("woohoo!")
26         x = x * y
27         if x % 2 == 0:
28             x = x + 1
29         return x
30     else:
31         print("110")
32         x = x + 5
33     return x
34
35
36 print(bar(g(8), f(3, 4)))
```