

**Question 1: Multiple Choice** Completely fill in the bubble next to your answer using a pencil. Each question should have exactly one filled-in bubble.

1.1. What is the *type* of the following expression?

1

- int
- float
- str
- bool
- TypeError

1.2. What is the *type* of the following expression?

1

- int
- float
- str
- bool
- TypeError

1.3. What is the result of the following expression?

1

- 220
- "110110"
- TypeError
- "220"

1.4. What is the *result* of the following expression?

1

- 20
- 20.4
- "20"
- TypeError
- 21

1.5. What is the *type* of this value in Python?

1

- bool
- str
- TypeError
- int

1.6. What *value* will the following expression evaluate to?

1

- f
- "f"
- o
- "o"
- TypeError

1.7. What does the *len* function do in Python?

- Converts a value to a string
- Rounds a number to the nearest whole number
- Returns the length of a sequence
- Converts a string to a number
- Counts the digits in an int

1.8. What is a *bool* data type in Python?

- Data type for storing text
- Data type for storing numbers
- Data type for storing True/False values
- Data type for storing any type of information
- Data type for storing complex numbers

1.9. What is the indexing start position in Python sequences?

- 0
- 1
- 1
- None
- TypeError

1.10. Which of the following is a float in Python?

- 10
- 10.0
- "10.0"
- True

1.11. What does a docstring do in Python?

- It performs calculations.
- It changes the value of a variable.
- It provides documentation for a function or module.
- It declares a new function.
- It calls a function.

1.12. Is Python case-sensitive language?

- Yes
- No

1.13. What does the following Python expression evaluate to?

```
1 bool(0)
```

- False
- True
- 0
- 1

1.14. Which of the following is the correct way to concatenate two strings in Python?

- "fox" , "hare"
- "fox" : "hare"
- "fox" + "hare"
- "fox" "hare"

1.15. What will the following Python expression evaluate to?

```
1 1 + True
```

- True
- 2
- 1
- False

1.16. What will the following Python expression evaluate to?

```
1 3.1415 * 2
```

- 6.283
- 6
- 5
- 2

1.17. Which of the following is a valid identifier name (e.g. function name) in Python?

- 123rabbit
- rabbit\_123
- rabbit-123
- rabbit 123

1.18. What is the result of evaluating the following Python expression?

```
1 2 ** 3
```

- 5
- 8
- 6
- 4

1.19. What is the result of the following operation?

```
1 110 + "110"
```

- 220
- "110110"
- "220"
- TypeError

1.20. What does this code evaluate to in Python?

```
1 int(5.75)
```

- 5.5
- 5
- 6
- TypeError

1.21. Suppose we have a `float` named `x`, use a constructor function call expressions to convert it into an `int`. Which of the following is correct?

- `x("int")`
- `int(x)`
- `(int)x`
- `float_to_int(x)`

1.22. Suppose we have the following literal expression `"3.14"`. What is the type of this expression?

- `int`
- `float`
- `str`
- `bool`

1.23. Which of the following is a literal expression for a string in Python?

- `string("Hello")`
- `"Hello"{}`
- `"Hello"`
- `print("Hello")`

1.24. Which are valid `bool` literals in Python?

- `True / False`
- `Yes / No`
- `1 / 0`
- `On / Off`

1.25. What function would you use to get the data type of an object?

- `data_type()`
- `get_type()`
- `typeof()`
- `type()`

**Question 2: Multiple Choice** Completely fill in the bubble next to your answer using a pencil. Each question should have exactly one filled-in bubble.

2.1. A function call expression's evaluated value is determined by \_\_\_\_\_.

- the first return statement evaluated in the function definition
- the last return statement evaluated in the function definition
- each and every return statement evaluated in the function definition

2.2. Below is a properly defined Python function. What is the the role of the "beverage" parameter?

```
1 def order_beverage(beverage: str) -> str:  
2     """This function orders a beverage"""  
3     return "Your " + beverage + " is ready!"
```

- The return value
- An input to the function
- The function's name
- The external variable

2.3. What will be the result of the following Python function?

```
1 def evaluate_length(name: str) -> int:  
2     """This function returns the length of the name"""  
3     return len(name)
```

`evaluate_length("Foxglove")`

- 7
- 8
- "8"
- "Foxglove"

2.4. Consider the function declared below. What value is returned when `fairytale_winter(coziness=3, days=5)` is called?

```
1 def fairytale_winter(coziness: int, days: int) -> float:  
2     """This function estimates the enjoyment during winter days."""  
3     return coziness * days / 2.0
```

- 15.0
- 7.5
- 7
- "7.5"

2.5. What will be the *printed output* of the following Python function call?

```
1 def say_hello(name: str) -> None:  
2     """This function prints a greeting"""  
3     print("Hello, " + name + "!")
```

`say_hello(name="Doe")`

- Hello, Doe!
- "Hello, Doe!"
- Nothing
- TypeError

**Question 3: Evaluate** and Respond to the following questions.

3.1. What is the return type of the following function?

```
1 def acorn_count(tree_count: int, acorns_per_tree: int) -> int:  
2     """Returns the total number of acorns in the woodland."""  
3     return tree_count * acorns_per_tree
```

- int
- str
- float
- bool

3.2. Complete the following code to call `acorn_count` function such that 110 is printed to the screen.

```
1 print(acorn_count(_____))
```

3.3. What value and type does the following expression evaluate to: `int("1" + "2")`

3.4. What value and type does the following expression evaluate to: `3 + 4 * 5`

3.5. What value and type does the following expression evaluate to?

```
1 len(str(10 // 3))
```

3.6. What value and type does the following expression evaluate to?

```
1 str(10 % 3)
```

3.7. Fill in the blank. Given the below definition, what value does the following function call evaluate to: `sum_length(recipe_str="PumpkinPie", ingredient_str="SugarBeet")`

```
1 def sum_length(recipe_str:str, ingredient_str:str) -> int:  
2     """Returns the sum of the length of a recipe and an ingredient"""  
3     return len(recipe_str) + len(ingredient_str)
```

**Question 4: Identification** Given the following code listing, identify lines which contain the following concepts.

```
1 def total_feet(sparrows: int, rabbits: int) -> int:
2     """Returns the total number of feet among the woodland creatures"""
3     return bird_feet(birds=sparrows) + rabbit_feet(rabbits=rabbits)
4
5
6 def bird_feet(birds: int) -> int:
7     """Returns the total number of bird feet given a number of birds"""
8     return 2 * birds
9
10
11 def rabbit_feet(rabbits: int) -> int:
12     """Returns the total number of rabbit hindfeet and forefeet."""
13     return 4 * rabbits
14
15
16 print(total_feet(sparrows=3, rabbits=2))
```

4.1. Identify the line number where a function definition signature is found.

- Line 2
- Line 3
- Line 6
- Line 9
- Line 10

4.2. Identify the line number where a docstring is written.

- Line 1
- Line 2
- Line 4
- Line 5
- Line 6

4.3. Identify the line number where an expression is found.

- Line 1
- Line 2
- Line 5
- Line 8
- Line 10

4.4. What is `-> int` an example of?

- parameter type
- return type
- expression
- type conversion

4.5. Identify the line number where a function call is made.

- Line 1
- Line 2
- Line 3
- Line 4
- Line 5

4.6. Which of the following is a parameter name?

- `bird_feet`
- `print`
- `birds`
- `bunnies`

4.7. What would be the printed result of the code listing?

- 5
- 10
- 12
- 14
- 20

4.8. Which function definition is jumped into *second*?

- `print`
- `total_feet`
- `bird_feet`
- `rabbit_feet`

**Question 5: Memory Diagram** Trace a memory diagram of the following code listing and then answer the sub-questions. You do not need to diagram the sub-questions.

```
1 def total_feet(sparrows: int, rabbits: int) -> int:
2     """Returns the total number of feet among the woodland creatures"""
3     return bird_feet(birds=sparrows) + rabbit_feet(rabbits=rabbits)
4
5
6 def rabbit_feet(rabbits: int) -> int:
7     """Returns the total number of rabbit hindfeet and forefeet."""
8     return 4 * rabbits
9
10
11 def bird_feet(birds: int) -> int:
12     """Returns the total number of bird feet given a number of birds"""
13     return 2 * birds
14
15 print(total_feet(sparrows=3, rabbits=2))
```

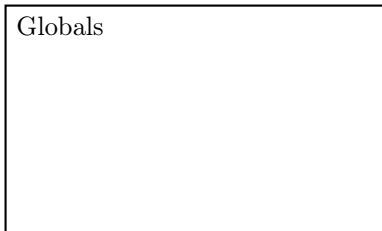
Output



Stack

Heap

Globals



**Question 6: Memory Diagram** Trace a memory diagram of the following code listing and then answer the sub-questions. You do not need to diagram the sub-questions.

```
1  """Some fun functions..."""
2
3
4  def quadruple(x: int) -> int:
5      """Quadruple an int!"""
6      print("quadruple(" + str(x) + ")")
7      return double(x=double(x=x))
8
9
10 def double(x: int) -> int:
11     """Double an int!"""
12     print("double(" + str(x) + ")")
13     return 2 * x
14
15
16 print(quadruple(x=2))
```

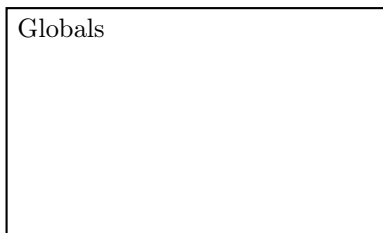
Output



Stack

Heap

Globals





**Question 7: Memory Diagram** Trace a memory diagram of the following code listing and then answer the sub-questions. You do not need to diagram the sub-questions.

```
1  """Functions of a circle..."""
2
3
4  def main() -> None:
5      """Entrypoint of Program"""
6      print(perimeter(radius=1.0))
7      print(area(radius=1.0))
8      return None
9
10
11 def area(radius: float) -> float:
12     """Calculate area of a circle"""
13     return 3.14 * radius**2
14
15
16 def perimeter(radius: float) -> float:
17     return 2 * 3.14 * radius
18
19
20 main()
```

Output

Stack

Heap

Globals