**Advanced Python Practice Questions with Answers**

**1. What are the key differences between a list, a set, and a dictionary in Python?**

* **Answer:**
  + **List**: An ordered, mutable collection of elements, allows duplicates. Example: my\_list = [1, 2, 3]
  + **Set**: An unordered, mutable collection of unique elements, does not allow duplicates. Example: my\_set = {1, 2, 3}
  + **Dictionary**: A collection of key-value pairs, where keys are unique and unordered. Example: my\_dict = {"name": "Alice", "age": 25}

**2. Write a Python program to print all prime numbers between 1 and 50.**

* **Answer:**

python

def is\_prime(n):

if n < 2:

return False

for i in range(2, int(n\*\*0.5) + 1):

if n % i == 0:

return False

return True

for num in range(1, 51):

if is\_prime(num):

print(num)

**3. Explain what a nested loop is. Write a Python program using nested loops to print a multiplication table (1 to 5).**

* **Answer:**  
  A **nested loop** is a loop inside another loop. In Python, you can have for or while loops inside other loops.

python

for i in range(1, 6):

for j in range(1, 6):

print(i \* j, end="\t")

print()

**4. Write a Python program to count the frequency of each character in a string.**

* **Answer:**

python

string = "hello world"

freq = {}

for char in string:

if char in freq:

freq[char] += 1

else:

freq[char] = 1

for char, count in freq.items():

print(f"{char}: {count}")

**5. What will be the output of the following code and why?**

scss

```python

x = [1, 2, 3]

y = x

y.append(4)

print(x)

print(y)

```

* **Answer:**  
  The output will be:

csharp

[1, 2, 3, 4]

[1, 2, 3, 4]

This is because x and y both refer to the same list in memory. Modifying y will also affect x.

**6. Write a Python program to find the factorial of a number using a while loop.**

* **Answer:**

python

num = int(input("Enter a number: "))

factorial = 1

while num > 1:

factorial \*= num

num -= 1

print(f"Factorial: {factorial}")

**7. Explain the difference between break and continue statements in Python loops.**

* **Answer:**
  + break: Exits the loop entirely.
  + continue: Skips the current iteration and moves to the next one.

Example:

python

for i in range(5):

if i == 2:

break # loop will terminate when i equals 2

print(i)

for i in range(5):

if i == 2:

continue # loop will skip printing when i equals 2

print(i)

**8. Write a Python function to check if a string is an anagram (two strings with the same characters in a different order).**

* **Answer:**

python

def is\_anagram(str1, str2):

return sorted(str1) == sorted(str2)

str1 = "listen"

str2 = "silent"

if is\_anagram(str1, str2):

print("The strings are anagrams")

else:

print("The strings are not anagrams")

**9. What is the output of the following code?**

css

```python

a = 5

b = 10

if a + b == 15:

print("Equal to 15")

elif a + b > 15:

print("Greater than 15")

else:

print("Less than 15")

```

* **Answer:**  
  The output will be:  
  Equal to 15

**10. Write a Python program to reverse a list without using the reverse() method.**

* **Answer:**

python

my\_list = [1, 2, 3, 4, 5]

reversed\_list = []

for i in range(len(my\_list)-1, -1, -1):

reversed\_list.append(my\_list[i])

print(reversed\_list)

**11. What are the possible outcomes of an if-else block, and how many conditions can you check using elif?**

* **Answer:**  
  An if-else block has two possible outcomes: the if condition is either true or false.  
  You can have as many elif statements as needed to check multiple conditions. The block can also include a final else to cover all other cases.

**12. Write a Python program to find the second largest number in a list.**

* **Answer:**

python

numbers = [10, 20, 4, 45, 99]

first = second = float('-inf')

for num in numbers:

if num > first:

second = first

first = num

elif num > second and num != first:

second = num

print(f"The second largest number is: {second}")

**13. What will be the output of the following code?**

bash

```python

count = 5

while count > 0:

print(count)

count -= 1

else:

print("Finished!")

```

* **Answer:**  
  The output will be:

5

4

3

2

1

Finished!