# Python Coding Questions for Hoonartek Interview

### 1. Fibonacci Sequence

**Question: Write a Python function to generate the Fibonacci sequence up to the Nth number.**

Answer:

```python
def fibonacci(n):
    fib_seq = [0, 1]
    while len(fib_seq) < n:
        fib_seq.append(fib_seq[-1] + fib_seq[-2])
    return fib_seq[:n]

# Example usage
print(fibonacci(10))  # Output: [0, 1, 1, 2, 3, 5, 8, 13, 21, 34]
```

### 2. Palindrome Check

**Question: Write a function that checks if a given string is a palindrome.**

Answer:

```python
def is_palindrome(s):
    s = s.lower().replace(" ", "")  # Convert to lowercase and remove spaces
    return s == s[::-1]

# Example usage
print(is_palindrome("Racecar"))  # Output: True
print(is_palindrome("Hello"))  # Output: False
```

### 3. Find the Second Largest Number

**Question: Write a Python function to find the second largest number in a list.**

Answer:

```python
```

```
def second_largest(numbers):
    unique_numbers = list(set(numbers))  # Remove duplicates
    unique_numbers.sort(reverse=True)
    return unique_numbers[1] if len(unique_numbers) > 1 else None

# Example usage
numbers = [10, 20, 4, 45, 99, 45]
print(second_largest(numbers))  # Output: 45
```

### 4. Flatten a Nested List

### Question: Write a Python function to flatten a nested list.

Answer:

```python
def flatten_list(nested_list):
    flat_list = []
    for item in nested_list:
        if isinstance(item, list):
            flat_list.extend(flatten_list(item))  # Recursion for nested lists
        else:
            flat_list.append(item)
    return flat_list

# Example usage
nested_list = [[1, 2, [3]], [4, 5], [6, [7, 8]]]
print(flatten_list(nested_list))  # Output: [1, 2, 3, 4, 5, 6, 7, 8]
```

### 5. Anagram Check

### Question: Write a Python function to check if two strings are anagrams.

Answer:

```python
def are_anagrams(str1, str2):
    return sorted(str1) == sorted(str2)

# Example usage
print(are_anagrams("listen", "silent"))  # Output: True
print(are_anagrams("hello", "world"))  # Output: False
```

## 6. Count the Frequency of Characters in a String

**Question: Write a Python function that counts the frequency of each character in a string.**

Answer:

```python
from collections import Counter

def char_frequency(s):
    return Counter(s)

# Example usage
print(char_frequency("hello"))
# Output: Counter({'o': 1, 'h': 1, 'e': 1, 'l': 2})
```

## 7. Find Missing Number in an Array

**Question: Write a Python function to find the missing number in a list of integers from 1 to n.**

Answer:

```python
def find_missing_number(arr, n):
    expected_sum = n * (n + 1) // 2
    actual_sum = sum(arr)
    return expected_sum - actual_sum

# Example usage
arr = [1, 2, 4, 5, 6]
n = 6
print(find_missing_number(arr, n))  # Output: 3
```

## 8. Reverse Words in a String

**Question: Write a Python function to reverse the words in a given sentence.**

Answer:

```python
def reverse_words(sentence):
    words = sentence.split()
    return " ".join(reversed(words))
```

```
# Example usage
print(reverse_words("Python  Interview Preparation"))
# Output: "Preparation Interview Python"
```

## 9. Generate Prime Numbers

## Question: Write a Python function to generate all prime numbers up to a given number.

Answer:

```python
def is_prime(num):
    if num <= 1:
        return False
    for i in range(2, int(num ** 0.5) + 1):
        if num % i == 0:
            return False
    return True

def generate_primes(n):
    primes = [i for i in range(2, n + 1) if is_prime(i)]
    return primes

# Example usage
print(generate_primes(30))  # Output: [2, 3, 5, 7, 11, 13, 17, 19, 23, 29]
```

## 10. Find Duplicates in a List

## Question: Write a Python function to find all duplicate numbers in a list.

Answer:

```python
def find_duplicates(lst):
    seen = set()
    duplicates = set()
    for num in lst:
        if num in seen:
            duplicates.add(num)
        else:
            seen.add(num)
    return list(duplicates)
```

```
# Example usage
numbers = [1, 2, 3, 4, 2, 3, 5, 6, 7, 7]
print(find_duplicates(numbers))  # Output: [2, 3, 7]
```

### 11. Reverse a String

### Question: Write a Python program to reverse a string.

Answer:

```python
def reverse_string(s):
    return s[::-1]

# Example usage
print(reverse_string("hello"))  # Output: "olleh"
```

### 12. Sum of List Elements

### Question: Write a Python program to find the sum of all elements in a list.

Answer:

```python
def sum_of_list(lst):
    return sum(lst)

# Example usage
print(sum_of_list([1, 2, 3, 4, 5]))  # Output: 15
```

### 13. Find the Factorial of a Number

### Question: Write a Python function to find the factorial of a given number.

Answer:

```python
def factorial(n):
    if n == 0 or n == 1:
        return 1
    else:
        return n * factorial(n - 1)

# Example usage
```

```
print(factorial(5))  # Output: 120
```

## 14. Check if a Number is Prime

## Question: Write a Python function to check whether a number is prime or not.

Answer:

```python
def is_prime(num):
    if num <= 1:
        return False
    for i in range(2, int(num**0.5) + 1):
        if num % i == 0:
            return False
    return True

# Example usage
print(is_prime(11))  # Output: True
print(is_prime(4))   # Output: False
```

## 15. Find the Largest Element in a List

## Question: Write a Python function to find the largest element in a list.

Answer:

```python
def find_largest(lst):
    return max(lst)

# Example usage
print(find_largest([10, 20, 4, 45, 99]))  # Output: 99
```

## 16. Merge Two Lists

## Question: Write a Python program to merge two lists into a single list.

Answer:

```python
def merge_lists(list1, list2):
    return list1 + list2
```

```
# Example usage
list1 = [1, 2, 3]
list2 = [4, 5, 6]
print(merge_lists(list1, list2))  # Output: [1, 2, 3, 4, 5, 6]
```

## 17. Remove Duplicates from a List

## Question: Write a Python function to remove duplicates from a list.

Answer:

```python
def remove_duplicates(lst):
    return list(set(lst))

# Example usage
print(remove_duplicates([1, 2, 3, 4, 2, 3, 5]))  # Output: [1, 2, 3, 4, 5]
```

## 18. Sort a List

## Question: Write a Python function to sort a list of integers.

Answer:

```python
def sort_list(lst):
    return sorted(lst)

# Example usage
print(sort_list([5, 3, 8, 6, 7, 2]))  # Output: [2, 3, 5, 6, 7, 8]
```

## 19. Find the Length of a List

## Question: Write a Python program to find the length of a list without using the `len()` function.

Answer:

```python
def list_length(lst):
    count = 0
    for _ in lst:
        count += 1
    return count
```

```
# Example usage
print(list_length([1, 2, 3, 4, 5]))  # Output: 5
```

## 20. Count Vowels in a String

## Question: Write a Python function to count the number of vowels in a string.

Answer:

```python
def count_vowels(s):
    vowels = "aeiouAEIOU"
    count = 0
    for char in s:
        if char in vowels:
            count += 1
    return count

# Example usage
print(count_vowels("hello"))  # Output: 2
```