Exercises

1. Soln:

```python
def is_prime(number):
    """Check if a number is prime.

    Args:
        number (int): The number to check.

    Returns:
        bool: True if the number is prime, False otherwise.
    """
    # Prime numbers are greater than 1
    if number <= 1:
        return False

    # Check for factors from 2 to the square root of the number
    for i in range(2, int(number ** 0.5) + 1):
        if number % i == 0:
            # If the number is divisible by any other number, it's not prime
            return False

    # If no factors found, the number is prime
    return True

# Input number from user
num = int(input("Enter a number: "))

# Check if the input number is prime
if is_prime(num):
    print(f"{num} is a prime number")
else:
    print(f"{num} is not a prime number")

Enter a number: 7
7 is a prime number
```

2. Soln:

```python
import random

# Generate two random numbers
random_number1 = random.randint(1, 30)  # Generate a random integer
between 1 and 100
random_number2 = random.randint(1, 20)   # Generate a random float
```

```python
# between 1 and 10
print("Random Number 1:", random_number1)
print("Random Number 2:", random_number2)

# Ask the user to enter the product of these two numbers
user = int(input('Enter the product of two numbers: '))

# Product of two numbers
product = random_number1 * random_number2

# Check if the user's input matches value of the product of two
numbers
if(user == product):
    print("That's correct")
else:
    print(f"That's incorrect, The correct product of two numbers is
{product}")
```

```
Random Number 1: 6
Random Number 2: 20
Enter the product of two numbers: 120
That's correct
```

3. Soln:

```python
# Iterate through numbers from 100 to 200
for num in range(100, 201):
    # Check if the number is odd
    if num % 2 != 0:
        # Print the square of the odd number
        print(f"The square of {num} is {num**2}")
```

```
The square of 101 is 10201
The square of 103 is 10609
The square of 105 is 11025
The square of 107 is 11449
The square of 109 is 11881
The square of 111 is 12321
The square of 113 is 12769
The square of 115 is 13225
The square of 117 is 13689
The square of 119 is 14161
The square of 121 is 14641
The square of 123 is 15129
The square of 125 is 15625
The square of 127 is 16129
The square of 129 is 16641
The square of 131 is 17161
The square of 133 is 17689
The square of 135 is 18225
```

```
The square of 137 is 18769
The square of 139 is 19321
The square of 141 is 19881
The square of 143 is 20449
The square of 145 is 21025
The square of 147 is 21609
The square of 149 is 22201
The square of 151 is 22801
The square of 153 is 23409
The square of 155 is 24025
The square of 157 is 24649
The square of 159 is 25281
The square of 161 is 25921
The square of 163 is 26569
The square of 165 is 27225
The square of 167 is 27889
The square of 169 is 28561
The square of 171 is 29241
The square of 173 is 29929
The square of 175 is 30625
The square of 177 is 31329
The square of 179 is 32041
The square of 181 is 32761
The square of 183 is 33489
The square of 185 is 34225
The square of 187 is 34969
The square of 189 is 35721
The square of 191 is 36481
The square of 193 is 37249
The square of 195 is 38025
The square of 197 is 38809
The square of 199 is 39601
```

4. Soln:

```python
def count_words(text):
    """Count the number of words in the given text.

    Args:
        text (str): The input text.

    Returns:
        dict: A dictionary where keys are words and values are their
counts.
    """
    # Split the text into words
    words = text.split()

    # Create a dictionary to store word counts
```

```python
    word_counts = {}

    # Iterate through the words and update the counts
    for word in words:
        # Remove punctuation from the word
        word = word.strip(".,!?")
        # Convert the word to lowercase
        word = word.lower()
        # Update the count for the word
        if word in word_counts:
            word_counts[word] += 1
        else:
            word_counts[word] = 1

    return word_counts

# Input text
input_text = "This is a sample text. This text will be used to
demonstrate the word counter."

# Count the words in the input text
word_counts = count_words(input_text)

# Print the word counts
for word, count in word_counts.items():
    print(f"'{word}': {count}")
```

```
'this': 2
'is': 1
'a': 1
'sample': 1
'text': 2
'will': 1
'be': 1
'used': 1
'to': 1
'demonstrate': 1
'the': 1
'word': 1
'counter': 1
```

5. Soln:

```python
def is_palindrome(s):
    """Check if a string is a palindrome.

    Args:
        s (str): The input string.

    Returns:
```

```python
        bool: True if the string is a palindrome, False otherwise.
    """
    # Remove spaces and punctuation, and convert to lowercase
    s = ''.join(char.lower() for char in s if char.isalnum())

    # Check if the input is not empty and is equal to its reverse
    return len(s) > 0 and s == s[::-1]

# Get user input
input_string = input("Enter a word: ")

# Check if the input is a palindrome
if is_palindrome(input_string):
    print(f"'{input_string}' is a palindrome")
else:
    print(f"'{input_string}' is not a palindrome")

Enter a word: level
'level' is a palindrome
```