

Here are 19 programming problems related to the topics of loops, conditional statements, and operators, along with their solutions in Python:

1. ****Sum of Numbers:****

Write a program to calculate and print the sum of all numbers from 1 to 100.

```
```python
sum_numbers = 0
for num in range(1, 101):
 sum_numbers += num
print("Sum of numbers:", sum_numbers)
```
```

2. ****Factorial Calculation:****

Write a program to calculate the factorial of a given number.

```
```python
def factorial(n):
 result = 1
 for i in range(1, n + 1):
 result *= i
 return result

number = 5
print(f"Factorial of {number}: {factorial(number)}")
```
```

3. ****Multiplication Table:****

Print the multiplication table for a given number.

```
```python
number = 7
for i in range(1, 11):
 print(f"{number} x {i} = {number * i}")
```
```

4. ****Check Even or Odd:****

Write a program to check if a given number is even or odd.

```
```python
number = 24
if number % 2 == 0:
 print(f"{number} is even.")
else:
 print(f"{number} is odd.")
```
```

5. ****Reverse a String:****

Reverse a given string without using built-in functions.

```

```python
original_string = "Python"
reversed_string = ""

for char in original_string:
 reversed_string = char + reversed_string

print("Reversed String:", reversed_string)
```

```

6. **Palindrome Check:**

Check if a given word is a palindrome.

```

```python
word = "level"
reversed_word = word[::-1]

if word == reversed_word:
 print(f"{word} is a palindrome.")
else:
 print(f"{word} is not a palindrome.")
```

```

7. **Power of a Number:**

Write a program to calculate the power of a number.

```

```python
base = 2
exponent = 5
result = 1

for _ in range(exponent):
 result *= base

print(f"{base} raised to the power of {exponent}: {result}")
```

```

8. **Fibonacci Sequence:**

Print the first 10 numbers of the Fibonacci sequence.

```

```python
n = 10
fib_sequence = [0, 1]

for _ in range(2, n):
 fib_sequence.append(fib_sequence[-1] + fib_sequence[-2])

print("Fibonacci Sequence:", fib_sequence)
```

```

```
```
```

### ### 9. \*\*Count Vowels:\*\*

Count the number of vowels in a given string.

```
```python
text = "Hello, World!"
vowels = "aeiouAEIOU"
count = 0

for char in text:
    if char in vowels:
        count += 1

print("Number of vowels:", count)
```
```

### ### 10. \*\*Prime Number Check:\*\*

Check if a given number is prime.

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

number = 17
if is_prime(number):
    print(f"{number} is a prime number.")
else:
    print(f"{number} is not a prime number.")
```
```

### ### 11. \*\*Calculate Average:\*\*

Write a program to calculate the average of a list of numbers.

```
```python
numbers = [15, 20, 25, 30, 35]
average = sum(numbers) / len(numbers)
print("Average:", average)
```
```

### ### 12. \*\*Count Words in a Sentence:\*\*

Count the number of words in a given sentence.

```
```python
```

```
sentence = "Python is a powerful programming language."
words = sentence.split()
word_count = len(words)
print("Number of words:", word_count)
````
```

### 13. \*\*Convert Temperature:\*\*

Convert temperatures from Celsius to Fahrenheit using a loop.

```
``python
celsius_temps = [0, 10, 20, 30, 40]
fahrenheit_temps = []

for celsius in celsius_temps:
 fahrenheit = (celsius * 9/5) + 32
 fahrenheit_temps.append(fahrenheit)

print("Celsius Temperatures:", celsius_temps)
print("Fahrenheit Temperatures:", fahrenheit_temps)
````
```

14. **Binary to Decimal Conversion:**

Convert a binary number to its decimal equivalent.

```
``python
binary_number = "101010"
decimal_number = 0

for i in range(len(binary_number)):
    decimal_number += int(binary_number[i]) * (2 ** (len(binary_number) - i - 1))

print(f"Decimal equivalent of {binary_number}: {decimal_number}")
````
```

### 15. \*\*Calculate GCD:\*\*

Calculate the greatest common divisor (GCD) of two numbers.

```
``python
def calculate_gcd(a, b):
 while b:
 a, b = b, a % b
 return a

num1 = 24
num2 = 36
gcd = calculate_gcd(num1, num2)

print(f"GCD of {num1} and {num2}: {gcd}")
````
```

16. **Print ASCII Table:**

Print the ASCII values and characters for all printable characters.

```
```python
for i in range(32, 127):
 print(f"ASCII: {i}, Character: {chr(i)}")
```
```

17. **Generate a Pattern:**

Generate the following pattern:

```
```
*
**


```
```

```
```python
for i in range(1, 6):
 print("*" * i)
```
```

18. **Factorization:**

Write a program to print the prime factorization of a given number.

```
```python
def prime_factors(n):
 factors = []
 i = 2

 while i <= n:
 if n % i == 0:
 factors.append(i)
 n //= i
 else:
 i += 1

 return factors

number = 56
print(f"Prime factorization of {number}: {prime_factors(number)}")
```
```

19. **Calculate BMI:**

Write a program to calculate the Body Mass Index (BMI).

```
```python
```

```
height = 1.75 # in meters
weight = 68 # in kilograms

bmi = weight / (height ** 2)
print(f"B
```