

Worksheet 11: Python Digit Problems

Name: _____ Date: _____

Instructions

- Answer in the blanks.
 - For “write code” questions, write valid Python code.
 - For “what does it print” questions, write the exact output.
 - Assume `n` is a **positive integer** unless the question says otherwise.
 - We have not learned `while`, so use `for _ in range(100):` and `break` when needed.
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Part A — Review: `%` and `//`

1) Last digit vs “remove last digit”

Python code:

```
n = 2026
x = n % 10    # Question 1.1
n = n // 10   # Question 1.2
```

Fill in the blanks:

- Question 1.1: `x` (the last digit) is _____
 - Question 1.2: The new `n` is _____
-

2) Fill in the blanks

Complete the sentences:

- `n % 10` gives the _____ digit of `n`. (First or last?)
 - `n // 10` _____ the last digit of `n`. (Keeps or removes?)
-

3) What does this print?

```
n = 507

for _ in range(3):
    print(n % 10)
    n = n // 10
```

Output:

Part B — Count digits

4) Complete the code (count digits)

Fill in the blank to remove the last digit:

```
n = 2026
count = 0

for _ in range(100):
    if n == 0:
        break
    count = count + 1
    n = _____

print(count)
```

5) What does it print?

Use this code:

```
n = 90
count = 0

for _ in range(100):
    if n == 0:
        break
    count = count + 1
    n = n // 10

print(count)
```

Output:

6) What does it print?

Use the same code for counting digits, but with `n = 1000` .

Output:

7) Write code: Count digits

Write code to print how many digits `n` has.

Use `n = 87531` .

Part C — Sum of digits

8) By hand: Sum of digits

Compute the sum of digits of `n = 2026` .

Answer: _____

9) What does this print?

```
n = 305
total = 0

for _ in range(100):
    if n == 0:
        break
    x = n % 10
    total = total + x
    n = n // 10

print(total)
```

Output:

10) Spot the mistake (sum of digits)

This code is supposed to sum digits, but it has a bug. Fix it.

```
n = 2026
total = 0

for _ in range(100):
    if n == 0:
        break
    x = n % 10
    total = total + x
    n = n / 10    # BUG: fix this line

print(total)
```

Write the corrected code:

```
# corrected code
```

Part D — Factors

11) By hand: List the factors

List all factors of in increasing order:

12) What does it print?

```
n = 10

for i in range(1, n + 1):
    if n % i == 0:
        print(i)
```

Output:

13) Write code: Print factors

Write code to print all factors of .

```
n = 18

# complete the code:
```

Part E — Prime check

14) Prime or not? (write True/False)

Write **True** if the number is prime; otherwise write **False**.

- 2 is prime: _____
 - 9 is prime: _____
 - 11 is prime: _____
 - 21 is prime: _____
-

15) What is the output?

```
n = 49
is_prime = True

for i in range(2, n):
    if n % i == 0:
        print(i)
        is_prime = False
        break

print(is_prime)
```

Output:

16) Challenge: Count factors (how many?)

Write code to count how many factors `n` has.

Use `n = 12` . (It has factors `1, 2, 3, 4, 6, 12` , so the answer should be 6.)

```
n = 12

count = 0

for _ in range(1, n + 1):
    # complete the code:

print(count)
```