Loop Logic Worksheet

June 24, 2025

1. What does this code output?

```
x = 5
y = 1
while x > 0:
    y = y + (x % 2)
    print(y, end=' ')
    x = x // 2
```

---

2. What does this code output?

```
a = 0
b = 7
while b > 1:
    a += b % 3
    b = b // 2
    if a > b:
        print(a * b, end=' ')
    else:
        print(a + b, end=' ')
```

---

3. What does this code output?

```
i = 3
total = 0
while i < 20:
    i = i + (i % 4)
    total += i
    if i % 5 == 0:
        print(total // 2, end=' ')
    else:
        print(i, end=' ')
```

---

4. What does this code output?

```
num = 12
result = 1
while num > 0:
    if num % 4 == 0:
        result *= 2
    elif num % 3 == 0:
        result -= 1
    else:
        result += num % 5
    print(result, end=' ')
    num //= 2
```

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5. What does this code output? (String indexing)

```
s = "matrix"
i = 0
output = ""
while i < len(s):
    if i % 2 == 0:
        output += s[i].upper()
    else:
        output += str(i)
    i = i + (len(s) % 3)
print(output)
```

---

6. What does this code output?

```
x = 1
y = 10
while x < y:
    x = x * 2 + 1
    y = y - (y % 3)
    print(f"{x}:{y}", end=' ')
```

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7. What does this code output?

```
a = 15
b = 3
while a > b:
    a = a - (a % b)
    b = b * 2 - 1
    print(a, b)
    if b > 10:
        break
```

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8. What does this code output? (String indexing)

```
word = "algorithm"
i = 1
res = ""
while i < len(word) - 1:
    res = word[i] + res
    i += len(word) // 3
print(res)
```

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9. What does this code output?

```
counter = 0
value = 25
while value > 0:
    if value % 2 == 0:
        value = value // 2
    else:
        value = value - (value % 7)
    counter += value % 4
    print(counter, end=' ')
```

---

10. What does this code output?

```
x = 4
y = 0
while x < 20 and y < 5:
    y = y + (x % 3)
    x = x * 2 - 1
    print(y * x, end=' ')
```

---

11. What does this code output? (String indexing)

```
text = "PYTHON"
i = 0
result = ""
while i < len(text):
    if text[i] in 'AEIOU':
        result += text[i].lower()
    else:
        result += str(ord(text[i]) % 10)
    i += 2
print(result)
```

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12. What does this code output?

```
a = 5
b = 2
while a < 30:
    a = a + (a % b)
    b = b * (b % 3) + 1
    print(a, b)
    if b > 5:
        a += 10
```

---

13. What does this code output?

```
num = 18
while num > 1:
    if num % 2 == 0:
        num = num // 2
    else:
        num = num * 3 + 1
    print(num, end=' ')
    if num == 1:
        break
```

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14. What does this code output? (String indexing)

```
s = "loops"
i = 0
output = ""
while i < len(s):
    output = output + s[len(s)-1-i]
    i += i % 2 + 1
print(output)
```

---

15. What does this code output?

```
x = 3
y = 1
while y < 20:
    x, y = y, x + y
    print(x, end=' ')
    if x % 4 == 0:
        y *= 2
```
