

Here are 50 code snippets with various loop combinations, ready for students to trace and print the outputs:

### 1. For in For:

```
for i in range(3):
    for j in range(2):
        print(f"i={i}, j={j}")
```

### 2. For in While:

```
x = 0
while x < 3:
    for i in range(2):
        print(f"x={x}, i={i}")
    x += 1
```

### 3. While in For:

```
for i in range(3):
    x = 0
    while x < 2:
        print(f"i={i}, x={x}")
        x += 1
```

### 4. While in While:

```
i = 0
while i < 3:
    j = 0
    while j < 2:
        print(f"i={i}, j={j}")
        j += 1
    i += 1
```

### 5. For with Continue:

```
for i in range(5):
    if i == 2:
        continue
    print(f"i={i}")
```

## 6. While with Break:

```
i = 0
while i < 5:
    print(f"i={i}")
    if i == 3:
        break
    i += 1
```

## 7. For in For with Condition:

```
for i in range(4):
    for j in range(i):
        print(f"i={i}, j={j}")
```

## 8. While in For with Condition:

```
for i in range(3):
    x = 0
    while x < i:
        print(f"i={i}, x={x}")
        x += 1
```

## 9. For in While with Break:

```
x = 0
while x < 3:
    for i in range(5):
        print(f"x={x}, i={i}")
        if i == 3:
            break
    x += 1
```

## 10. For in While with Continue:

```
x = 0
while x < 3:
    for i in range(5):
        if i == 3:
            continue
        print(f"x={x}, i={i}")
    x += 1
```

## 11. While in For with Break:

```
for i in range(3):
    x = 0
    while x < 5:
        if x == 2:
            break
        print(f"i={i}, x={x}")
        x += 1
```

## 12. While in While with Nested Break:

```
i = 0
while i < 3:
    j = 0
    while j < 3:
        if j == 2:
            break
        print(f"i={i}, j={j}")
        j += 1
    i += 1
```

## 13. For in For with Nested Continue:

```
for i in range(3):
    for j in range(4):
        if j == 2:
            continue
        print(f"i={i}, j={j}")
```

## 14. While in For with Nested Condition:

```
for i in range(5):
    x = 0
    while x < i:
        if x % 2 == 0:
            print(f"i={i}, x={x}")
        x += 1
```

## 15. For with Double Nested Loops:

```
for i in range(3):
    for j in range(2):
        for k in range(2):
            print(f"i={i}, j={j}, k={k}")
```

## 16. While in While with Double Nesting:

```
i = 0
while i < 2:
    j = 0
    while j < 2:
        k = 0
        while k < 2:
            print(f"i={i}, j={j}, k={k}")
            k += 1
        j += 1
    i += 1
```

## 17. For in While with Incremented Steps:

```
x = 0
while x < 5:
    for i in range(0, x):
        print(f"x={x}, i={i}")
    x += 2
```

## 18. While in For with Decrementing:

```
for i in range(3):
    x = 3
    while x > 0:
        print(f"i={i}, x={x}")
        x -= 1
```

## 19. For in For with Reversed Range:

```
for i in range(3):
    for j in range(2, 0, -1):
        print(f"i={i}, j={j}")
```

## 20. While with Skip Increment:

```
x = 0
while x < 5:
    x += 1
    if x == 3:
        continue
    print(f"x={x}")
```

## 21. For in While with Nested Skip:

```
x = 0
while x < 4:
    for i in range(4):
        if i == 2:
            continue
        print(f"x={x}, i={i}")
    x += 1
```

## 22. While in For with Nested Condition and Break:

```
for i in range(3):
    x = 0
    while x < 5:
        if x == 2:
            break
        print(f"i={i}, x={x}")
        x += 1
```

## 23. For in For with Multiple Conditions:

```
for i in range(5):
    for j in range(3):
        if i % 2 == 0 and j % 2 == 0:
            print(f"i={i}, j={j}")
```

## 24. While in While with Decrementing Counter:

```
x = 4
while x > 0:
    y = 3
    while y > 0:
        print(f"x={x}, y={y}")
        y -= 1
    x -= 1
```

## 25. For in For with Step Control:

```
for i in range(2, 10, 3):
    for j in range(1, i):
        print(f"i={i}, j={j}")
```

## 26. While in For with Increment and Continue:

```
for i in range(5):
    x = 0
    while x < 3:
        x += 1
        if x == 2:
            continue
        print(f"i={i}, x={x}")
```

## 27. For in For with Modulus:

```
for i in range(5):
    for j in range(5):
        if j % 2 == 0:
            print(f"i={i}, j={j}")
```

## 28. While in While with Increment and Break:

```
x = 0
while x < 5:
    y = 0
    while y < 5:
        print(f"x={x}, y={y}")
        if y == 3:
            break
        y += 1
    x += 1
```

## 29. For in For with Nested Continue and Break:

```
for i in range(3):
    for j in range(5):
        if j == 2:
            continue
        if j == 4:
            break
        print(f"i={i}, j={j}")
```

## 30. While in For with Nested Modulus and Continue:

```
for i in range(5):
    x = 0
    while x < 5:
        x += 1
```

```

    if x % 2 == 0:
        continue
    print(f"i={i}, x={x}")

```

### 31. For in For with Multiplication Table:

```

for i in range(1, 4):
    for j in range(1, 4):
        print(f"{i} * {j} = {i * j}")

```

### 32. While in While with Multiplication Table:

```

i = 1
while i < 4:
    j = 1
    while j < 4:
        print(f"{i} * {j} = {i * j}")
        j += 1
    i += 1

```

### 33. For with Nested Breaks:

```

for i in range(5):
    for j in range(3):
        print(f"i={i}, j={j}")
        if j == 1:
            break

```

### 34. While with Nested Modulus:

```

x = 1
while x < 6:
    y = 1
    while y < 6:
        if x % 2 == 0 and y % 2 == 0:
            print(f"x={x}, y={y}")
        y += 1
    x += 1

```

### 35. For with Nested Multiplication Condition:

```

for i in range(1, 4):
    for j in range(1,
4):

```

```

    if (i * j) % 2 == 0:
        print(f"{i} * {j} = {i * j}")

```

### 36. While in For with Nested Modulus and Increment:

```

for i in range(4):
    x = 1
    while x < 4:
        if x % 2 == 0:
            print(f"i={i}, x={x}")
        x += 1

```

### 37. For in For with Division:

```

for i in range(1, 4):
    for j in range(1, 4):
        print(f"{i} / {j} = {i / j:.2f}")

```

### 38. While in For with Incrementing Steps:

```

for i in range(4):
    x = 0
    while x < 3:
        print(f"i={i}, x={x}")
        x += 2

```

### 39. For in While with Step Control:

```

x = 0
while x < 4:
    for i in range(1, x+1):
        print(f"x={x}, i={i}")
    x += 1

```

### 40. While in For with Break and Continue:

```

for i in range(5):
    x = 0
    while x < 3:
        x += 1
        if x == 2:
            continue
        print(f"i={i}, x={x}")
        if x == 3:
            break

```



#### 41. For in For with Division and Multiplication:

```
for i in range(1, 4):
    for j in range(1, 4):
        print(f"{i} / {j} * {i} = {i / j * i:.2f}")
```

#### 42. While with Triple Nesting:

```
x = 1
while x < 4:
    y = 1
    while y < 3:
        z = 1
        while z < 3:
            print(f"x={x}, y={y}, z={z}")
            z += 1
        y += 1
    x += 1
```

#### 43. For with Complex Nested Condition:

```
for i in range(3):
    for j in range(5):
        if i + j == 4:
            print(f"i={i}, j={j}")
```

#### 44. While in While with Condition and Break:

```
x = 0
while x < 5:
    y = 0
    while y < 4:
        print(f"x={x}, y={y}")
        if y == 3:
            break
        y += 1
    x += 1
```

#### 45. For in For with Modulus Check:

```
for i in range(1, 6):
    for j in range(1, i):
        if i % j == 0:
            print(f"{i} is divisible by {j}")
```

#### 46. While in While with Modulus Condition:

```
x = 1
while x < 5:
    y = 1
    while y < x:
        if x % y == 0:
            print(f"{x} is divisible by {y}")
        y += 1
    x += 1
```

#### 47. For in For with Addition:

```
for i in range(3):
    for j in range(4):
        print(f"{i} + {j} = {i + j}")
```

#### 48. While with Triple Nesting and Condition:

```
i = 1
while i < 3:
    j = 1
    while j < 3:
        k = 1
        while k < 3:
            if i + j + k == 5:
                print(f"i={i}, j={j}, k={k}")
            k += 1
        j += 1
    i += 1
```

#### 49. For in For with Square Calculation:

```
for i in range(3):
    for j in range(4):
        print(f"{i}^2 + {j}^2 = {i**2 + j**2}")
```

#### 50. While in For with Multiple Nested Breaks:

```
for i in range(5):
    x = 0
    while x < 5:
        print(f"i={i}, x={x}")
        if x == 2:
            break
```

```
        x += 1
    if i == 3:
        break
```

These code snippets offer diverse loop structures with different conditions and nesting for students to trace. Let me know if you need any specific adjustments!