Types Worksheet

May 31, 2025

1. What does this code output?

```
i = 1
while i <= 5:
    print(str(i) * i)
    i += 1
```

2. What does this code output?

```
k = 0
while k < 20:
    if k % 3 == 1:
        print(k, end=' ')
    k += 2
```

3. What does this code output?

```
i = 5
while i >= 1:
    j = 0
    while j < i:
        print(i, end='')
        j += 1
    print()
    i -= 1
```

4. What does this code output?

```
a = 0
b = 2
while b != 0:
    if a / b < 0.5:  # Short-circuit prevents division by zero
```

```
        print(f"{a}/{b}", end=' ')
    a += 1
    b -= 1
```

5. What does this code output?

```
rows = 3
i = 0
while i < rows:
    j = 0
    while j <= i:
        print(rows - i, end='')
        j += 1
    print()
    i += 1
```

6. What does this code output?

```
x = 3
y = 0
while x > 0 and y < 2:
    x -= 1
    y += 1
    print(x, y)
```

7. What does this code output?

```
a = 5
b = 3
while a > b:
    print(a, b)
    a -= 2
    b += 1
    if a <= b:
        print("TERMINATE")
```

8. What does this code output?

```
p = 0
q = 4
while q > 0:
    p = p + (q % 2)
    print(p, end=' ')
    q -= 1
```

9. What does this code output?

```
m = 1
n = 5
while n > m:
    if (n + m) % 3 == 0:
        print(n, m)
    n -= 2
    m += 1
```

10. Explain why the final print statement is unreachable:

```
r = 4
s = 1
while r > s:
    print(r, s)
    r -= 1
    s += 1
    if r == s:
        print("MIDPOINT")
print("FINAL")  # Why is this unreachable?
```

11. What is printed? Hint: Google "string subscripts in python"

```
s = "AbCdEf"
i = 0
res = ""
while i < len(s):
    if i % 2 == 0:
        res += s[i].lower()
    else:
        res += s[i].upper()
    i += 1
print(res)
```

12. What is printed?

```
text = "HELLO"
i = 0
output = ""
while i < len(text):
    if text[i].lower() in "aeiou":
        output += '*'
        break
    else:
        output += text[i].lower()
    i += 1
print(output)
```

---

13. What is printed?

```
word = "c0d3ab0de"
i = 0
total = 0
while i < len(word):
    if word[i].isdigit():
        total += int(word[i]) * (i if i % 2 == 0 else -i)
    i += 1
print(total)
```

---

14. What is printed?

```
s = "a1b2c3d4"
k = 0
result = 0
while k < len(s):
    if s[k].isalpha():
        result += ord(s[k].lower()) - 96
    else:
        result -= int(s[k])
    k += 1
print(result)
```

---

15. What is printed?

```
text = "NaN"
count = 0
while text.lower() != "infinity":
    print(text, end=" ")
    count += 1
    text = text[1:] + text[0]
    if count >= 5:
        break
```

---

16. What is printed?

```
phrase = "LoOpS"
i = 0
output = ""
while i < len(phrase):
```

```
    if phrase[i].isupper():
        output += phrase[i].lower()
    elif phrase[i].islower():
        output += str(i)
    else:
        output += '?'
    i += 1
print(output)
```

---

17. What is printed?

```
s = "x3y2z1"
i = 0
res = ""
while i < len(s):
    if s[i].isalpha():
        char = s[i].lower()
        num = int(s[i+1])
        res += char * num
        i += 1  # Skip next digit
    i += 1
print(res)
```

---

18. What is printed?

```
code = "A1B2C3"
i = 0
sum_val = 0
while i < len(code):
    if i % 2 == 0:  # Even index (0-indexed)
        sum_val += ord(code[i].lower()) - 96
    else:
        sum_val -= int(code[i])
    i += 1
print(sum_val)
```

---

19. What is printed?

```
text = "PYTHON"
i = len(text) - 1
output = ""
while i >= 0:
    if (len(text) - i) % 2 == 1:
        output += text[i].lower()
    else:
        output += text[i]
    i -= 1
print(output)
```

---

20. Why does this loop terminate and what is printed?

```
s = "TRUTH"
count = 0
while "false".upper() != "FALSE" or count < 2:
    print(s[count % len(s)], end="")
    count += 1
    if count > len(s) * 2:
        break
```
