Loops & Traversals

Name: _____ Period: ____ Date: _____

Objectives

- Write and trace iteration statements: `REPEAT n TIMES` and `REPEAT UNTIL` (AAP-2.K).
- Traverse a list with `FOR EACH` and determine the result (AAP-2.O).
- Describe linear search and recognize infinite loops (AAP-2.O, AAP-2.K).

Directions: Trace each loop step by step. Code is in AP pseudocode.

Section 1: Repeat Loops

1. Trace. What is displayed?

```
total ← 0
REPEAT 4 TIMES
{
  total ← total + 5
}
DISPLAY(total)
```

Answer: _____

2. Trace. What is displayed?

```
count ← 0
REPEAT UNTIL (count ≥ 3)
{
  count ← count + 1
}
DISPLAY(count)
```

Answer: _____

3. In a `REPEAT UNTIL(condition)` loop, when does an **infinite loop** happen?

_____

Section 2: Traversing a List

4. Trace this `FOR EACH` traversal. What is displayed?

```
nums ← [2, 4, 6]
sum ← 0
FOR EACH x IN nums
{
  sum ← sum + x
}
DISPLAY(sum)
```

Answer: _____

5. Trace. What is displayed?

```
words ← ["cat", "dog", "fish"]
FOR EACH w IN words
{
  DISPLAY(w)
}
```

Answer: _____

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Section 3: Search and Algorithms

6. Describe how a **linear (sequential) search** finds a value in a list.

7. A complete traversal accesses every element; a partial traversal accesses only some. When searching for a specific value, why might a search stop *before* the end of the list?

8. Write pseudocode (or describe in steps) a loop that counts how many values in a list `data` are greater than 50.

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