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Formative Assessment 2:

Systems Development 2A

2.
```
import java.util.ArrayList;
import java.util.List;

public class PowerCalculator {

  public static void main(String[] args) {
    // Test the method with some examples
    System.out.println(recursivePower(2, 3));   // Output: 8.0
    System.out.println(recursivePower(2, -3));  // Output: 0.125
    System.out.println(recursivePower(5, 0));   // Output: 1.0
    System.out.println(recursivePower(3, -2));  // Output: 0.1111111111111111
  }

  public static <T extends Number> double recursivePower(T base, int exponent) {
    List<Double> results = new ArrayList<>();
    return powerHelper(base.doubleValue(), exponent, results);
  }

  private static double powerHelper(double base, int exponent, List<Double> results) {
    // Base case: when exponent is 0
    if (exponent == 0) {
      return 1;
    }
```

```
        // Handle negative exponent
        else if (exponent < 0) {
            return 1.0 / powerHelper(base, -exponent, results);
        }
        // Recursive case for positive exponent
        else {
            double result = base * powerHelper(base, exponent - 1, results);
            results.add(result); // Store intermediate results (optional)
            return result;
        }
    }
}
```