

APCS – Mr. Ascione

Number Analyzer

OBJECTIVE: This lab was designed to review basic class creation and to introduce and demonstrate how to use an ArrayList.

SPEC: In this project, you will be completing methods for a Number class and a Number Analyzer class that consists of an ArrayList of Number objects. The Number class stores a number and has the ability to determine if a number is odd or perfect.

A perfect number is any number equal to the sum of its divisors. For example, 6 is perfect because it is equal to the sum of its divisors. The divisors of 6 are 1, 2 and 3. $1 + 2 + 3 = 6$, therefore 6 is 'perfect'.

The NumberAnalyzer object stores a list of Number objects and includes methods to count the number of odds, evens and perfect numbers in the Number list.

PROCEDURE: Complete the Number class which will be used to determine if a number is odd, not odd, or perfect. Then, use this Number class in conjunction with the Number Analyzer class to determine how many numbers in the list are odd, even, and perfect.

SAMPLE OUTPUT:

```
C:\Windows\system32\cmd.exe
[5, 12, 9, 6, 1, 4, 8, 6]
odd count = 3
even count = 5
perfect count = 2
```

TEST CASES:

5 12 9 6 1 4 8 6

5 12 3 7 28 496 81 65 33 11

1 2 3 4 5 6 7 8 11 13 151 16 17 18 19 20

6 is a perfect number.

$$1 \times 6 = 6$$

$$2 \times 3 = 6$$

Divisors: 1, 2, 3

$$1 + 2 + 3 = 6$$

Files Needed:

Number.java

NumberAnalyzer.java

NumberAnalyzerRunner.java