**Assignment 1 – Die Object**

**Dean Zeller 20 points**

### CS200 Due: Friday, February 9th

**Fall 2018**

***Objective*** The students will design a simple die object for use in future game-related assignments, with the ability to change the number of sides.

***Background***

Many board games employ some sort of random determination mechanic. The most common method for gameplay is a set of six-sided dice (singular, die). *Yahtzee* uses five dice, whereas *Monopoly*, *Parcheesi* and *Backgammon* use two. This assignment is about creating a tool or utility to easily generate random numbers. Other games such as *Dungeons and Dragons* use dice of different sizes, denoted by a D. D4 refers to a 4-sided die, with a chance of any number between 1 and 4, whereas a D20 would include a chance at every number between 1 and 20. The object you create within this assignment will be used for future assignments, both game related and for generating random numbers easily.

***Layout:***

Object: Die (Note: do not call it dice, that is plural and denotes multiple die)

Attributes:

name - name of the die, “D4” or “Sword Damage”

numSides – number of sides on the die (default of 6)

currentValue – the current value of the die roll

Methods:

Constructor (No parameters) – create a die object, with 6 sides

Constructor(numSides as parameter) –

create a die object, with a parameter for number of sides

getNumSides – return the number of sides (numSides)

getCurrentValue – return the current value of the die (currentValue)

roll – set the currentValue to a generated random value between 1 and the number of sides inclusive.

cheat – Set the current value to the specified parameter, with error checking to ensure the new value is not greater than the number of sides

toString – return a formatted table listing the values of the attributes

***Testing:***

Use your program tester to put your die object through several tests. Run the five tests shown on the test run, and create three other tests. Emulate games as necessary, to identify use.

***Test Run:***

Test 1: a common 6-sided die (D6)

Range 1 to 6

Single number test: 5

Multiple number test: 3 1 6 4 5 1 2 3 1 1

Test 2: percentile die (D100)

Range 1 to 100

Single number test: 17

Multiple number test: 31 12 63 41 15 17 28 39 81 71

Test 3: random month (D12)

Range 1 to 12

Single number test: 4

Multiple number test: 8 2 7 4 5 7 2 12 8 11

Test 4: Monopoly turn (2 D6 added together)

Range 2 to 12

Single number test: 7

Multiple number test: 7 9 8 5 10 6 7 9 11 8

Test 5: Yahtzee, chance field (5 D6 all added together)

Range 5 to 30

Single number test: 17

Multiple number test: 13 12 16 14 15 11 12 23 14 16

Other Test:

5th level mage Fireball (5 D6)

5th level mage Magic missile (3 D4 + 3)

Cure light wounds (D8)

Dagger Damage on a large creature (D3)

Craps turn (2 D6)

Game of life spinner (D10)

Flipping a coin (D2)

Magic 8-Ball (D20)

Trivial pursuit and many other games (D6)