Dice Arithmetic.

Many games require players to roll dice. While Six sided dice are most common, other dice are also used. For instance games use 4 sided, 8 sided, 10 sided, 12, and 20 sided dice, just to name a few.

The number and sides of dice to roll are indicated using the notation `nDs` where `n` is the number of dice to roll, and `s` is the number of sides on each dice.
E.g. `4D6` means "Roll four six-sided dice". Similarly `1D20` requires the player to roll one 20-sided dice.

The "value" of a roll is the sum of all dice rolled. For example the value of `2D6` is the sum of individual values obtained by rolling two Six-sided dice.
The maximum in this case is 12 (both dice rolled a 6), while the minimum possible value is 2 (both dice rolled a 1).

In some games, users are required to roll dice of different types and then add, subtract, or otherwise manipulate the values.
For instance, `4D6 + 1D4` means "Add the value of a `4D6` roll to the value of a `1D4` roll". The minimum and maximum values possible in this case are respectively 5, and 28.

Problem

Design a command line utility to simulate dice arithmetic. Users should be able to enter simple arithmetic - only plus/minus signs, no parentheses - and see a random outcome.
Support the following Dice only - 4 Sided, 6 Sided, 8 Sided, 10 Sided, 12 Sided, and 20 Sided.

For e.g.

```
$>  diceRoller 4D6 + 3D4            # Valid, show a result.
$>  diceRoller 4D6 + 3D25           # 25 Sided dice are
not supported, show an error message.
$>  diceRoller 0D6 - 1D4            # 0 dice doesn't make sense,
show an error message.
$>  diceRoller 3D8 - 2D4            # Valid, show a result.
$>  diceRoller 3D8 - 2D4  + 4D6     # Valid, show a result.
$>  diceRoller 4D11 + 3D4           # 11 Sided dice are not
supported, show an error message.
$>  diceRoller 4D6+3D4              # Valid, spaces before/after
operators should be ignored.
$>  diceRoller 4 D 6 + 3D4          # Invalid, no spaces allowed
in nDs notation.
$>  diceRoller 4d6 + 3D4            # Valid, treat d and D the
same. Show result.
```

Each dice should be rolled randomly. Bonus points for working out a mechanism to test if the dice rolls are truly random.

Design data structures and algorithms for in-memory file system

Explain the data structures and algorithms that you would use to design an in-memory file system. Illustrate with an example in the code logic where possible.