



# Specifications: CompositeGrade

In addition to the obvious specifications illustrated in the UML class diagram, the CompositeGrade class must satisfy the following specifications.

1. If a constructor is passed a key that is null or empty (i.e., "") then the constructor must throw an `IllegalArgumentException`.
2. The `add()` method adds the reference to the given `Grade` object to the `List` of `Grade` objects (i.e., it must **not** make a deep copy).
3. The `getValue()` method must use the `Filter` and `GradingStrategy` to calculate the value to return.
  - 3.1. The `getValue()` method must first call the `apply()` method of the `Filter` object (if there is one).
    - 3.1.1. The value returned must be null if a `SizeException` is thrown by the `apply()` method.
  - 3.2. The `getValue()` method must then calculate the value to return using the filtered `List<Grade>` (if there is a `Filter`) or the original `List<Grade>` (if there is not).
    - 3.2.1. The value returned must be null if there is no `GradingStrategy`.
    - 3.2.2. Otherwise the value returned must be the result of calling the `calculate()` method of the `GradingStrategy`.
      - 3.2.2.1. The value returned must be null if a `SizeException` is thrown by the `calculate()` method.