ADDS Prac 5 Design

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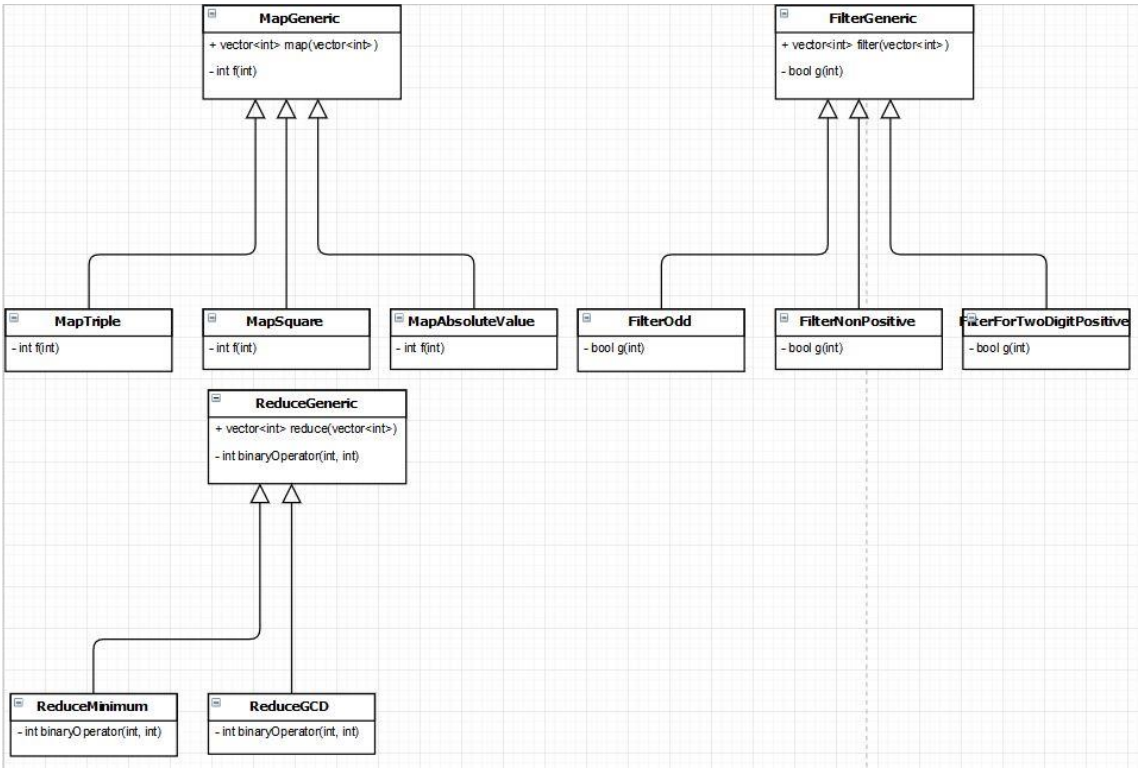
UML Diagram



Description

- MapGeneric
  - Vector<int> map(vector<int>) : This function takes a vector as a argument, apply f(x) to all elements by using recursion and return the vector.
  - Int f(int) : This is a pure virtual function, this method is overridden later in the derived lassesto deliver specific map operations.
- MapTriple
  - Int f(int x) : this function takes an integer and return an integer of 3*x.
- MapSquare
  - Int f(int x) : this function takes an integer and return x^2.
- MapAbsoluteValue

  - Int f(int x) : this function takes an integer and return an integer of |x|.
- FilterGeneric
  - Vector<int> filter(vector<int>) : This function takes a vector as a argument, apply g(int) to all elements and return the vector.
  - bool g(int) : This is a pure virtual function, this method is overridden later in the derived lassesto deliver specific map operations.
- FilterOdd
  - bool g(int x) : this function takes an integer and return true if x is an odd number, else return false.
- FilterNonPositive
  - bool g(int x) : this function takes an integer and return true if x is an non positive number, else return false.
- FilterForTwoDigitPositive
  - bool g(int x) : this function takes an integer and return true if x is between 10 ~ 99, else return false.
- ReduceGeneric
  - Vector<int> reduce(vector<int>) : This function takes a vector as a argument, apply g(int) to all elements and return the vector.
  - Int binaryOperation(int, int) : This is a pure virtual function, this method is overridden later in the derived lassesto deliver specific map operations.
- ReduceMinimum
  - Int binaryOperation(int, int) : this function takes two arguments and return the smaller one.
- ReduceGCD
  - Int binaryOperation(int, int) : this function takes two arguments and return the bigiest common denominator of the two
- Main
  - Construct a vector/deque using these 20 integers. We denote the list by L = [x1; x2; :::; x20].
  - Convert the original list L to L0 = [3*x1; 3*x2; :::; 3*xn] using map
  - From L', select all positive two digit integers that are also odd.Let the resulting list be L".
  - Compute the minimum value and the greatest common denominator of L" (using reduce). Output the results, separated by space

Testing

1. **input**: 6, -11, 53, -16, 73, 128, 105, 104, -71, -179, 102, 12, 21, -145, -99, 199, -156, -186, 43, -189

convert to triple absolute

L' = 18, 33, 159, 48, 219, 384, 315, 312, 213, 537, 306, 36, 63, 435, 297, 597, 468, 558, 129, 567],

Fint numbers which is odd and within 10~99

L" = 33, 63

Find minimum and greatest common denominator

Output : 33, 3

2. **input** : -1, -2, -3, -9, 9, 55, 11, 33, 15, 10, -10, 20, 13, 14, 15, 16, 17, 18, -19, -20

convert to triple absolute

L' = 3, 6, 9, 27, 27, 165, 33, 99, 45, 30, 30, 60, 39, 42, 45, 48, 51, 54, 57, 60

Fint numbers which is odd and within 10~99

L"= 27, 27, 33, 99, 45, 39, 45, 51, 57

Find minimum and greatest common denominator

Output: 27, 3