Algorithm Design and Data Structures
Practical 5
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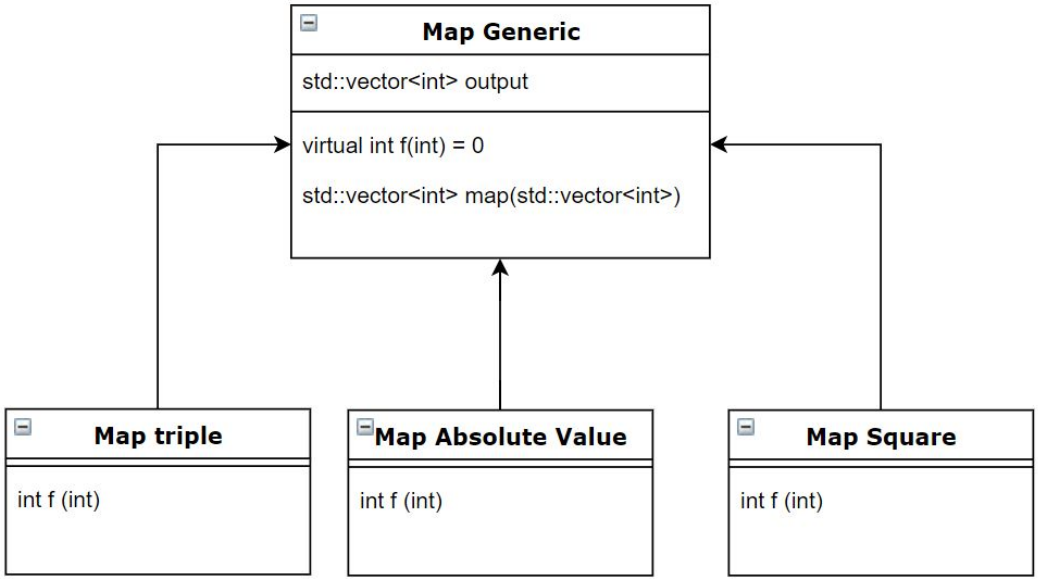
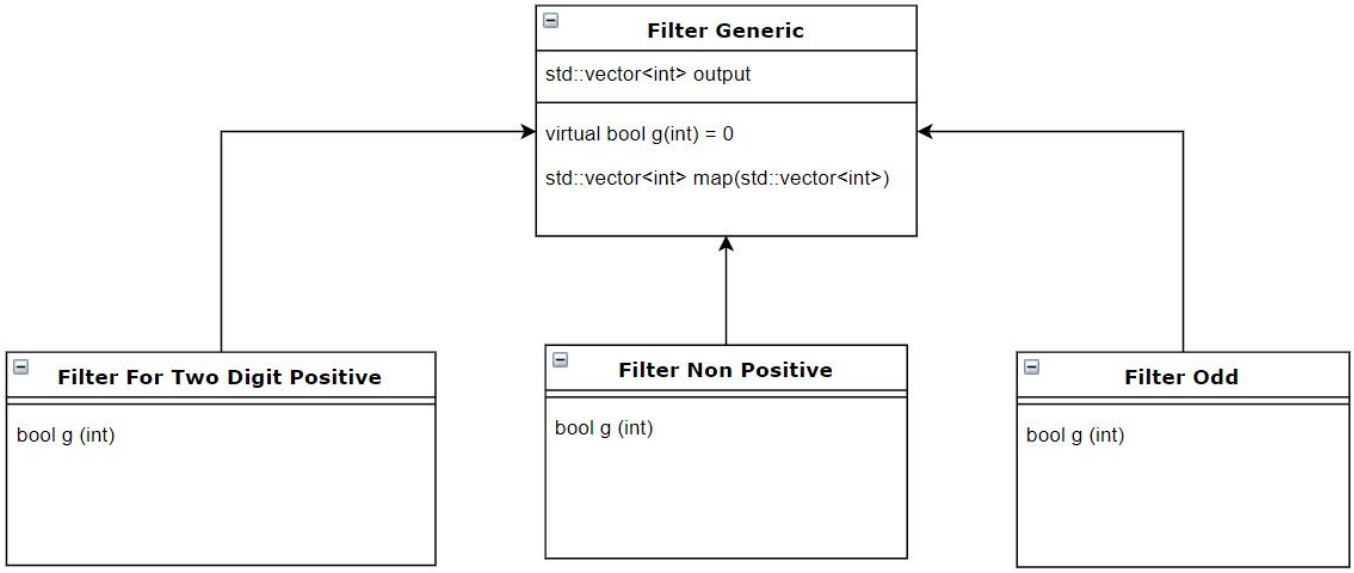
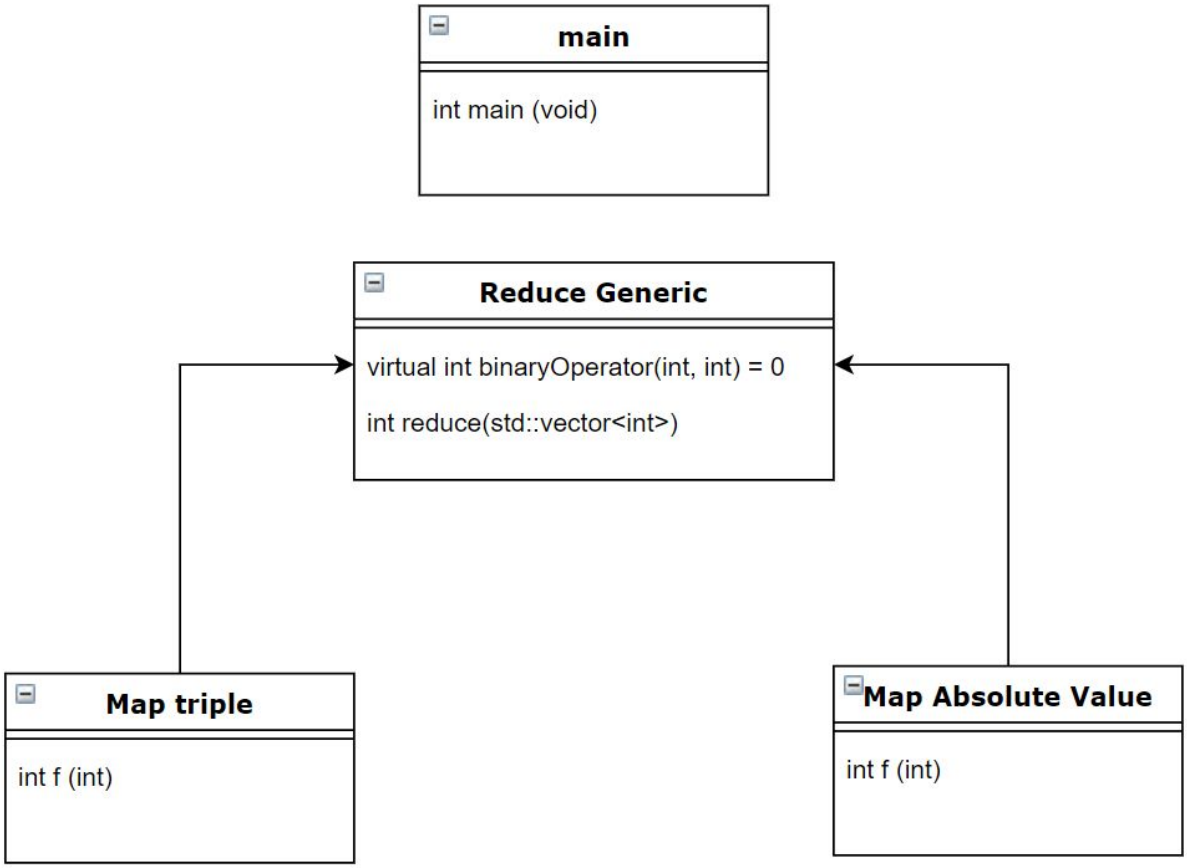
UML







Functions

main()
Converts string to int using while loop and the ascii of values between 0 and 9 and also the '-'.
Checks to see if the size is 20 and brings up an error if not.
Applies the three types of functions then prints to console.

MapGeneric()
Uses recursive loop to operate the f function on every element in the vector.

MapTriple()
Multiplies the values in the vector by 3.

MapAbsoluteValue()
Multiplies the values in the vector by -1 if the values is less than zero.

MapSquare()
Multiplies the values in the vector by themselves.

FilterGeneric()
Uses recursive loop to operate the g function on every element in the vector then modifies the vector depending on whether or not g is true.

FilterTwoDigitPositive()
Returns true if the input is between 10 and 99.

FilterNonPositive()
Returns true if the input is less than 1.

FilterOdd()
Returns true if the input is odd.

ReduceGeneric()
Takes the last two values from the vector and applies the binary operator on them. Removes the two values from the vector and adds this new value from the binary operator then recursively loops until the size is two.

ReduceGCD()
Takes in two inputs. Takes the remainder of input one against input two then pass that and input 2 into the function recursively until the remainder is zero.

RecudeMinimum()
Compares one input against another then returns the smaller one.

Testing
Input: asdasd-5,dasawws -24, -123, -81, 200, 157, asdasd84, 67, -83, -60, asd-72, 192, -25, -20, -50, -181,-70, -15, -108, -123
Output: 15 15

Input: 0
Output: ERROR: invalid input size

Input: 0,asdasd-5,dasawws -24, -123, -81, 200, 157, asdasd84, 67, -83, -60, asd-72, 192, -25, -20, -50, -181,-70, -15, -108, -123
Output: ERROR: invalid input size

Input: -15,-15,-15,-15,-15,-15,-15,-15,-15,-15,-15,-15,-15,-15,-15,-15,-15,-15,-15,-15,-15
Output: 45 45

Input: 0, 0,0, 0,0, 0,0, 0,0, 0,0, 0,0, 0,0, 0,0, 0,0, 0,0, 0
Output: -1 -1

Input: 0, 0,0, 0,0, 0,0, 0,0, 0,0, 0,0, 0,0, 0,0, 0,0, 0,0, -11
Output: 33 33