This is similar to what I walk through in the video, but I’ve also provided screenshots of a simple run of the program.

1. Main menu of the program

A screenshot of a computer program

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1. Select 1 to import the customer balance file and enter the name of the csv file. This creates a mapping of customer nodes.
2. Select 2 to import the security file and enter the name of the csv file. This creates a security node from each line of the csv and builds the red-black tree.

A screenshot of a computer program

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A screenshot of a computer screen

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1. Select 6 to view the current state of each customer’s pledged balance. Over Pledged is good, Under Pledged indicates additional securities are needed.
2. Select 8 to view the current change listing (which securities have been unpledged or pledged at this point. The securities listed below are from the import function determining the customer was no longer in the map and then unpledged, it is freeing it up by adding to the red black tree, or the it was determined that the pledged amount exceeded 50% of the aggregate customer balance. These are unpledged to allow the pledge updating process try to find more reasonable securities.

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1. Select 9 to see a printout of the current state of the red-black tree noting that the tree is effectively balanced prior to any further additions or removals.

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1. Select 3 to perform pledging updates – This just looks for customer balances that needs additional pledges added and performs updates.
2. Select 6 to view the current state of each customer’s pledged balance. All customers are now sufficiently pledged.

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1. Select 10 to run red-black tree tests – All tests pass. Securities Remaining in Tree as well as Total Market Value sum in the tree agree to test file.

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A screenshot of a computer

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1. Select 9 to see a printout of the current state of the red-black tree noting that the tree is still effectively balanced after removing securities from the tree.
2. Select 8 all required additions are added to the changes vectors (pledge additions and removals).

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1. Select 4 to perform clear all and pledge – This will clear all customer pledges, pledge additions and removals and It will attempt to pledge based on a declining threshold. This function set is called automatically as part of pledge updates if adequate securities can’t be found. There aren’t many differences here with such a small security listing, but larger listings could have an impact. Even if pledge updates in option 3 is ran and successful, this may still be beneficial to finding more appropriately valued security in relation to the balance to cover in order to reduce excess collateral.

A screenshot of a computer screen

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1. Select 6 to view the current state of each customer’s pledged balance. All customers are still sufficiently pledged.

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Description automatically generated

1. Select 10 to run red-black tree tests – All tests pass. Securities Remaining in Tree as well as Total Market Value sum in the tree agree to test file.

A screenshot of a computer

Description automatically generated

1. Select 8 all required additions are added to the changes vectors (pledge additions and removals).

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1. Select 9 to see a printout of the current state of the red-black tree noting that the tree is still effectively balanced after removing all securities and repledging.

A computer screen shot of white text

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1. Select 7 to export the changes and customer balances to csv files.

A screen shot of a computer

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1. These will be the names of the export files.

