CSE674-HW1 Woody Haddad

This project has 5 code files:

1. Main.cpp
2. singleList.h
3. doubleList.h
4. singleList.cpp
5. doubleList.cpp

The header files contain declarations of the list classes and everything that goes with those such as the singleNode struct for singly linked lists and the doubleNode struct for the doubly linked lists. I assigned both a head and a tail for both singly and double linked lists as that proved to make things easier in implementing the three functions. What was also useful was the “add\_node(int)” function, which I used to create my lists in main, and the transverse() function, which prints out the list objects. For the double linked list, I created an additional function, reverseTransverse(), which prints the list starting from the tail and going backwards through the “prev” pointers. This function verifies that all the “prev” pointers are accurate after performing pointer manipulations.

As the assignment asks, I performed pointer manipulation on everything. Scrolling through the code should make it obvious that I did not change values directly, but instead I reassigned the pointers. In the case of teamOfFour, I performed some variation of bubbleSort to sort the groups of 4. I used two nested while loops to perform it.

For reverse() and shuffle(), I created vectors and stored pointer values in those. I then used the pointer values to reassign the node structure.

See below for program output.

Program output: \*\*\*\*\*\*\*\*\*\*\*\*Test Case 0: Initial lists\*\*\*\*\*\*\*\*\*\*\*\* S1\_single 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100 S2\_single 3, -16, 9, -32, 15, -48, 21, -64, 27, -80, 33, -96, 39, -112, 45, -128, 51, -144, 57, -160, 63, -176, 69, -192, 75, -208, 81, -224, 87, -240, 93, -256, 99, -272, 105, -288, 111, -304, 117, -320, 123, -336, 129, -352, 135, -368, 141, -384, 147, -400, 153, -416, 159, -432, 165, -448, 171, -464, 177, -480, 183, -496, 189, -512, 195, -528, 201, -544, 207, -560, 213, -576, 219, -592, 225, -608, 231, -624, 237, -640, 243, -656, 249, -672, 255, -688, 261, -704, 267, -720, 273, -736, 279, -752, 285, -768, 291, -784, 297, -800 S1\_double 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100 S1\_double backwards 100, 99, 98, 97, 96, 95, 94, 93, 92, 91, 90, 89, 88, 87, 86, 85, 84, 83, 82, 81, 80, 79, 78, 77, 76, 75, 74, 73, 72, 71, 70, 69, 68, 67, 66, 65, 64, 63, 62, 61, 60, 59, 58, 57, 56, 55, 54, 53, 52, 51, 50, 49, 48, 47, 46, 45, 44, 43, 42, 41, 40, 39, 38, 37, 36, 35, 34, 33, 32, 31, 30, 29, 28, 27, 26, 25, 24, 23, 22, 21, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1 S2\_double 3, -16, 9, -32, 15, -48, 21, -64, 27, -80, 33, -96, 39, -112, 45, -128, 51, -144, 57, -160, 63, -176, 69, -192, 75, -208, 81, -224, 87, -240, 93, -256, 99, -272, 105, -288, 111, -304, 117, -320, 123, -336, 129, -352, 135, -368, 141, -384, 147, -400, 153, -416, 159, -432, 165, -448, 171, -464, 177, -480, 183, -496, 189, -512, 195, -528, 201, -544, 207, -560, 213, -576, 219, -592, 225, -608, 231, -624, 237, -640, 243, -656, 249, -672, 255, -688, 261, -704, 267, -720, 273, -736, 279, -752, 285, -768, 291, -784, 297, -800 S2\_double backwards -800, 297, -784, 291, -768, 285, -752, 279, -736, 273, -720, 267, -704, 261, -688, 255, -672, 249, -656, 243, -640, 237, -624, 231, -608, 225, -592, 219, -576, 213, -560, 207, -544, 201, -528, 195, -512, 189, -496, 183, -480, 177, -464, 171, -448, 165, -432, 159, -416, 153, -400, 147, -384, 141, -368, 135, -352, 129, -336, 123, -320, 117, -304, 111, -288, 105, -272, 99, -256, 93, -240, 87, -224, 81, -208, 75, -192, 69, -176, 63, -160, 57, -144, 51, -128, 45, -112, 39, -96, 33, -80, 27, -64, 21, -48, 15, -32, 9, -16, 3 S1\_single teamOfFour 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100 S2\_single 3, -16, 9, -32, 15, -48, 21, -64, 27, -80, 33, -96, 39, -112, 45, -128, 51, -144, 57, -160, 63, -176, 69, -192, 75, -208, 81, -224, 87, -240, 93, -256, 99, -272, 105, -288, 111, -304, 117, -320, 123, -336, 129, -352, 135, -368, 141, -384, 147, -400, 153, -416, 159, -432, 165, -448, 171, -464, 177, -480, 183, -496, 189, -512, 195, -528, 201, -544, 207, -560, 213, -576, 219, -592, 225, -608, 231, -624, 237, -640, 243, -656, 249, -672, 255, -688, 261, -704, 267, -720, 273, -736, 279, -752, 285, -768, 291, -784, 297, -800 Test Case 1: S2\_single teamOfFour S2\_single before teamOfFour 3, -16, 9, -32, 15, -48, 21, -64, 27, -80, 33, -96, 39, -112, 45, -128, 51, -144, 57, -160, 63, -176, 69, -192, 75, -208, 81, -224, 87, -240, 93, -256, 99, -272, 105, -288, 111, -304, 117, -320, 123, -336, 129, -352, 135, -368, 141, -384, 147, -400, 153, -416, 159, -432, 165, -448, 171, -464, 177, -480, 183, -496, 189, -512, 195, -528, 201, -544, 207, -560, 213, -576, 219, -592, 225, -608, 231, -624, 237, -640, 243, -656, 249, -672, 255, -688, 261, -704, 267, -720, 273, -736, 279, -752, 285, -768, 291, -784, 297, -800 S2\_single after teamOfFour -32, -16, 3, 9, -64, -48, 15, 21, -96, -80, 27, 33, -128, -112, 39, 45, -160, -144, 51, 57, -192, -176, 63, 69, -224, -208, 75, 81, -256, -240, 87, 93, -288, -272, 99, 105, -320, -304, 111, 117, -352, -336, 123, 129, -384, -368, 135, 141, -416, -400, 147, 153, -448, -432, 159, 165, -480, -464, 171, 177, -512, -496, 183, 189, -544, -528, 195, 201, -576, -560, 207, 213, -608, -592, 219, 225, -640, -624, 231, 237, -672, -656, 243, 249, -704, -688, 255, 261, -736, -720, 267, 273, -768, -752, 279, 285, -800, -784, 291, 297 \*\*\*\*\*\*\*\*\*\*\*\*Test Case 2: S2\_double teamOfFour\*\*\*\*\*\*\*\*\*\*\*\* S2\_double -32, -16, 3, 9, -64, -48, 15, 21, -96, -80, 27, 33, -128, -112, 39, 45, -160, -144, 51, 57, -192, -176, 63, 69, -224, -208, 75, 81, -256, -240, 87, 93, -288, -272, 99, 105, -320, -304, 111, 117, -352, -336, 123, 129, -384, -368, 135, 141, -416, -400, 147, 153, -448, -432, 159, 165, -480, -464, 171, 177, -512, -496, 183, 189, -544, -528, 195, 201, -576, -560, 207, 213, -608, -592, 219, 225, -640, -624, 231, 237, -672, -656, 243, 249, -704, -688, 255, 261, -736, -720, 267, 273, -768, -752, 279, 285, -800, -784, 291, 297 S2\_double backwards 297, 291, -784, -800, 285, 279, -752, -768, 273, 267, -720, -736, 261, 255, -688, -704, 249, 243, -656, -672, 237, 231, -624, -640, 225, 219, -592, -608, 213, 207, -560, -576, 201, 195, -528, -544, 189, 183, -496, -512, 177, 171, -464, -480, 165, 159, -432, -448, 153, 147, -400, -416, 141, 135, -368, -384, 129, 123, -336, -352, 117, 111, -304, -320, 105, 99, -272, -288, 93, 87, -240, -256, 81, 75, -208, -224, 69, 63, -176, -192, 57, 51, -144, -160, 45, 39, -112, -128, 33, 27, -80, -96, 21, 15, -48, -64, 9, 3, -16, -32 \*\*\*\*\*\*\*\*\*\*\*\*test case 3: s1\_single reverse\*\*\*\*\*\*\*\*\*\*\*\* 100, 99, 98, 97, 96, 95, 94, 93, 92, 91, 90, 89, 88, 87, 86, 85, 84, 83, 82, 81, 80, 79, 78, 77, 76, 75, 74, 73, 72, 71, 70, 69, 68, 67, 66, 65, 64, 63, 62, 61, 60, 59, 58, 57, 56, 55, 54, 53, 52, 51, 50, 49, 48, 47, 46, 45, 44, 43, 42, 41, 40, 39, 38, 37, 36, 35, 34, 33, 32, 31, 30, 29, 28, 27, 26, 25, 24, 23, 22, 21, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1 \*\*\*\*\*\*\*\*\*\*\*\*Test Case 4: S1\_double reverse\*\*\*\*\*\*\*\*\*\*\*\* S1\_double 100, 99, 98, 97, 96, 95, 94, 93, 92, 91, 90, 89, 88, 87, 86, 85, 84, 83, 82, 81, 80, 79, 78, 77, 76, 75, 74, 73, 72, 71, 70, 69, 68, 67, 66, 65, 64, 63, 62, 61, 60, 59, 58, 57, 56, 55, 54, 53, 52, 51, 50, 49, 48, 47, 46, 45, 44, 43, 42, 41, 40, 39, 38, 37, 36, 35, 34, 33, 32, 31, 30, 29, 28, 27, 26, 25, 24, 23, 22, 21, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1 S1\_double backwards 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100 \*\*\*\*\*\*\*\*\*\*\*\*Test Case 5: S2\_single reverse\*\*\*\*\*\*\*\*\*\*\*\* -800, 297, -784, 291, -768, 285, -752, 279, -736, 273, -720, 267, -704, 261, -688, 255, -672, 249, -656, 243, -640, 237, -624, 231, -608, 225, -592, 219, -576, 213, -560, 207, -544, 201, -528, 195, -512, 189, -496, 183, -480, 177, -464, 171, -448, 165, -432, 159, -416, 153, -400, 147, -384, 141, -368, 135, -352, 129, -336, 123, -320, 117, -304, 111, -288, 105, -272, 99, -256, 93, -240, 87, -224, 81, -208, 75, -192, 69, -176, 63, -160, 57, -144, 51, -128, 45, -112, 39, -96, 33, -80, 27, -64, 21, -48, 15, -32, 9, -16, 3 \*\*\*\*\*\*\*\*\*\*\*\*Test Case 6: S2\_double reverse\*\*\*\*\*\*\*\*\*\*\*\* S2\_double -800, 297, -784, 291, -768, 285, -752, 279, -736, 273, -720, 267, -704, 261, -688, 255, -672, 249, -656, 243, -640, 237, -624, 231, -608, 225, -592, 219, -576, 213, -560, 207, -544, 201, -528, 195, -512, 189, -496, 183, -480, 177, -464, 171, -448, 165, -432, 159, -416, 153, -400, 147, -384, 141, -368, 135, -352, 129, -336, 123, -320, 117, -304, 111, -288, 105, -272, 99, -256, 93, -240, 87, -224, 81, -208, 75, -192, 69, -176, 63, -160, 57, -144, 51, -128, 45, -112, 39, -96, 33, -80, 27, -64, 21, -48, 15, -32, 9, -16, 3 S2\_double backwards 3, -16, 9, -32, 15, -48, 21, -64, 27, -80, 33, -96, 39, -112, 45, -128, 51, -144, 57, -160, 63, -176, 69, -192, 75, -208, 81, -224, 87, -240, 93, -256, 99, -272, 105, -288, 111, -304, 117, -320, 123, -336, 129, -352, 135, -368, 141, -384, 147, -400, 153, -416, 159, -432, 165, -448, 171, -464, 177, -480, 183, -496, 189, -512, 195, -528, 201, -544, 207, -560, 213, -576, 219, -592, 225, -608, 231, -624, 237, -640, 243, -656, 249, -672, 255, -688, 261, -704, 267, -720, 273, -736, 279, -752, 285, -768, 291, -784, 297, -800 \*\*\*\*\*\*\*\*\*\*\*\*Test Case 7: S1\_single shuffle\*\*\*\*\*\*\*\*\*\*\*\* 1, 51, 2, 52, 3, 53, 4, 54, 5, 55, 6, 56, 7, 57, 8, 58, 9, 59, 10, 60, 11, 61, 12, 62, 13, 63, 14, 64, 15, 65, 16, 66, 17, 67, 18, 68, 19, 69, 20, 70, 21, 71, 22, 72, 23, 73, 24, 74, 25, 75, 26, 76, 27, 77, 28, 78, 29, 79, 30, 80, 31, 81, 32, 82, 33, 83, 34, 84, 35, 85, 36, 86, 37, 87, 38, 88, 39, 89, 40, 90, 41, 91, 42, 92, 43, 93, 44, 94, 45, 95, 46, 96, 47, 97, 48, 98, 49, 99, 50, 100 \*\*\*\*\*\*\*\*\*\*\*\*Test Case 8: S1\_double shuffle\*\*\*\*\*\*\*\*\*\*\*\* S1\_double 1, 51, 2, 52, 3, 53, 4, 54, 5, 55, 6, 56, 7, 57, 8, 58, 9, 59, 10, 60, 11, 61, 12, 62, 13, 63, 14, 64, 15, 65, 16, 66, 17, 67, 18, 68, 19, 69, 20, 70, 21, 71, 22, 72, 23, 73, 24, 74, 25, 75, 26, 76, 27, 77, 28, 78, 29, 79, 30, 80, 31, 81, 32, 82, 33, 83, 34, 84, 35, 85, 36, 86, 37, 87, 38, 88, 39, 89, 40, 90, 41, 91, 42, 92, 43, 93, 44, 94, 45, 95, 46, 96, 47, 97, 48, 98, 49, 99, 50, 100 S1\_double backwards 100, 50, 99, 49, 98, 48, 97, 47, 96, 46, 95, 45, 94, 44, 93, 43, 92, 42, 91, 41, 90, 40, 89, 39, 88, 38, 87, 37, 86, 36, 85, 35, 84, 34, 83, 33, 82, 32, 81, 31, 80, 30, 79, 29, 78, 28, 77, 27, 76, 26, 75, 25, 74, 24, 73, 23, 72, 22, 71, 21, 70, 20, 69, 19, 68, 18, 67, 17, 66, 16, 65, 15, 64, 14, 63, 13, 62, 12, 61, 11, 60, 10, 59, 9, 58, 8, 57, 7, 56, 6, 55, 5, 54, 4, 53, 3, 52, 2, 51, 1 \*\*\*\*\*\*\*\*\*\*\*\*Test Case 9: S2\_single shuffle\*\*\*\*\*\*\*\*\*\*\*\* 3, -16, 9, -32, 15, -48, 21, -64, 27, -80, 33, -96, 39, -112, 45, -128, 51, -144, 57, -160, 63, -176, 69, -192, 75, -208, 81, -224, 87, -240, 93, -256, 99, -272, 105, -288, 111, -304, 117, -320, 123, -336, 129, -352, 135, -368, 141, -384, 147, -400, 153, -416, 159, -432, 165, -448, 171, -464, 177, -480, 183, -496, 189, -512, 195, -528, 201, -544, 207, -560, 213, -576, 219, -592, 225, -608, 231, -624, 237, -640, 243, -656, 249, -672, 255, -688, 261, -704, 267, -720, 273, -736, 279, -752, 285, -768, 291, -784, 297, -800 \*\*\*\*\*\*\*\*\*\*\*\*Test Case 10: S2\_double shuffle\*\*\*\*\*\*\*\*\*\*\*\* S2\_double 3, 153, -16, -416, 9, 159, -32, -432, 15, 165, -48, -448, 21, 171, -64, -464, 27, 177, -80, -480, 33, 183, -96, -496, 39, 189, -112, -512, 45, 195, -128, -528, 51, 201, -144, -544, 57, 207, -160, -560, 63, 213, -176, -576, 69, 219, -192, -592, 75, 225, -208, -608, 81, 231, -224, -624, 87, 237, -240, -640, 93, 243, -256, -656, 99, 249, -272, -672, 105, 255, -288, -688, 111, 261, -304, -704, 117, 267, -320, -720, 123, 273, -336, -736, 129, 279, -352, -752, 135, 285, -368, -768, 141, 291, -384, -784, 147, 297, -400, -800 S2\_double backwards -800, -400, 297, 147, -784, -384, 291, 141, -768, -368, 285, 135, -752, -352, 279, 129, -736, -336, 273, 123, -720, -320, 267, 117, -704, -304, 261, 111, -688, -288, 255, 105, -672, -272, 249, 99, -656, -256, 243, 93, -640, -240, 237, 87, -624, -224, 231, 81, -608, -208, 225, 75, -592, -192, 219, 69, -576, -176, 213, 63, -560, -160, 207, 57, -544, -144, 201, 51, -528, -128, 195, 45, -512, -112, 189, 39, -496, -96, 183, 33, -480, -80, 177, 27, -464, -64, 171, 21, -448, -48, 165, 15, -432, -32, 159, 9, -416, -16, 153, 3 Press any key to continue . . .