```cpp
// Jorge Rivas
#include <iostream>
#include <string>
#include <iomanip>
#include <stdio.h>
#include <algorithm>

using namespace std;
int searchList(int list[], int numElems, int value) {
	int index = 0;


	int position = -1;

	bool found = false;

	while (index < numElems && !found)

	{
		if (list[index] == value)

		{
			found = true;

			position = index;

		}
		index++;

	}
	return position;

}
void swap(int* xp, int* yp)
{
	int temp = *xp;
	*xp = *yp;
	*yp = temp;
}
void bubbleSort(int arr[], int n)
{
	int i, j;
	bool swapped;
	for (i = 0; i < n - 1; i++)
	{
		swapped = false;
		for (j = 0; j < n - i - 1; j++)
		{
			if (arr[j] > arr[j + 1])
			{
				swap(&arr[j], &arr[j + 1]);
				swapped = true;
			}
		}
		if (swapped == false)
			break;
	}
}
```

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void show(int a[], int arraysize)
{
	for (int i = 0; i < arraysize; ++i)
		cout << a[i] << " ";
}


int main(void)
{
	int a[150], x, ans, result;
	int i, j, temp, pass = 0;
	int asize = sizeof(a) / sizeof(a[0]);
	char input;
	char choice;

	for (int i = 0; i < 150; i++) a[i] = rand() % 150 + 1;

	do {
		cout << "1. Diplay my items " << endl;
		cout << "2. Selection Sort " << endl;
		cout << "3. Bubble Sort " << endl;
		cout << "4. Linear Sort " << endl;
		cout << "5. Binary Search " << endl;

		cout << "What do you want to do?";
		cin >> ans;
		switch (ans)
		{
		case 1:
			for (int i = 0; i < 150; i++) cout << a[i] << " ";
			break;
		case 2:
			cout << "\nThe array is : ";
			show(a, asize);
			sort(a, a + asize);
			cout << "\n\nThe array after sorting is : ";
			show(a, asize);
			break;
		case 3:
			cout << "Numbers in array:\n";
			for (i = 0; i < 150; i++)
			{
				cout << a[i] << "\t";
			}
			cout << endl;
			for (i = 0; i < 150; i++) {
				for (j = i + 1; j < 150; j++)
				{
					if (a[j] < a[i]) {
						temp = a[i];
						a[i] = a[j];
						a[j] = temp;
					}
				}
				pass++;
			}
			cout << "Sorted List: \n";
			for (i = 0; i < 150; i++)
```

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                        {
                                cout << a[i] << "\t";
                        }
                        cout << "\nNumber of passes taken to sort the list:" << pass <<
endl;
                        return 0;
                        break;
                case 4:
                        cout << "What are you looking for? ";
                        cin >> x;
                        result = searchList(a, 150, x);
                        if (result == -1) cout << "Couldnt find it";
                        else cout << "Its here.";
                        break;
                        break;
                case 5:
                        cout << "\nThe array is : ";
                        show(a, asize);
                        sort(a, a + asize);
                        cout << "\n\nThe array after sorting is : ";
                        show(a, asize);
                        cout << "\n\nEnter number you want to search? ";
                        cin >> input;
                        if (binary_search(a, a + 10, input))
                                cout << "\nElement found in the array";
                        else
                                cout << "\nElement not found in the array";
                        return 0;
                        break;
                }
                cout << "Continue? ";
                cin >> choice;
        } while (choice == 'y');

        return 0;
}
```
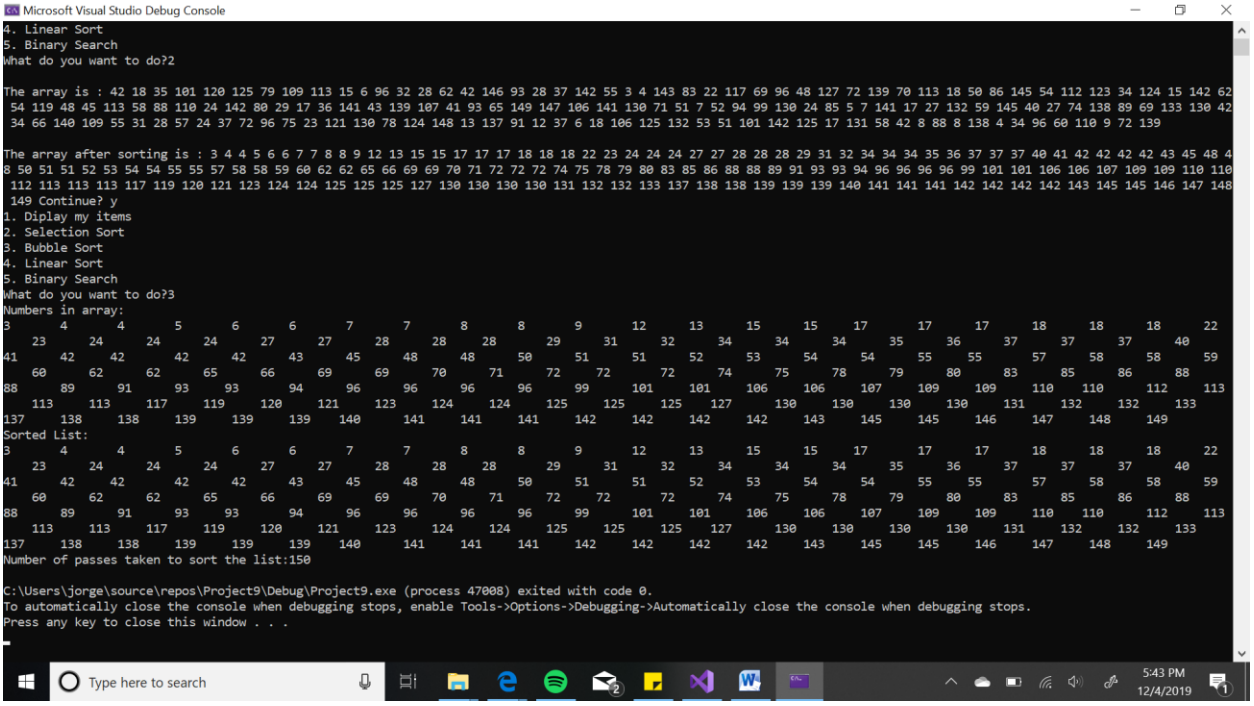
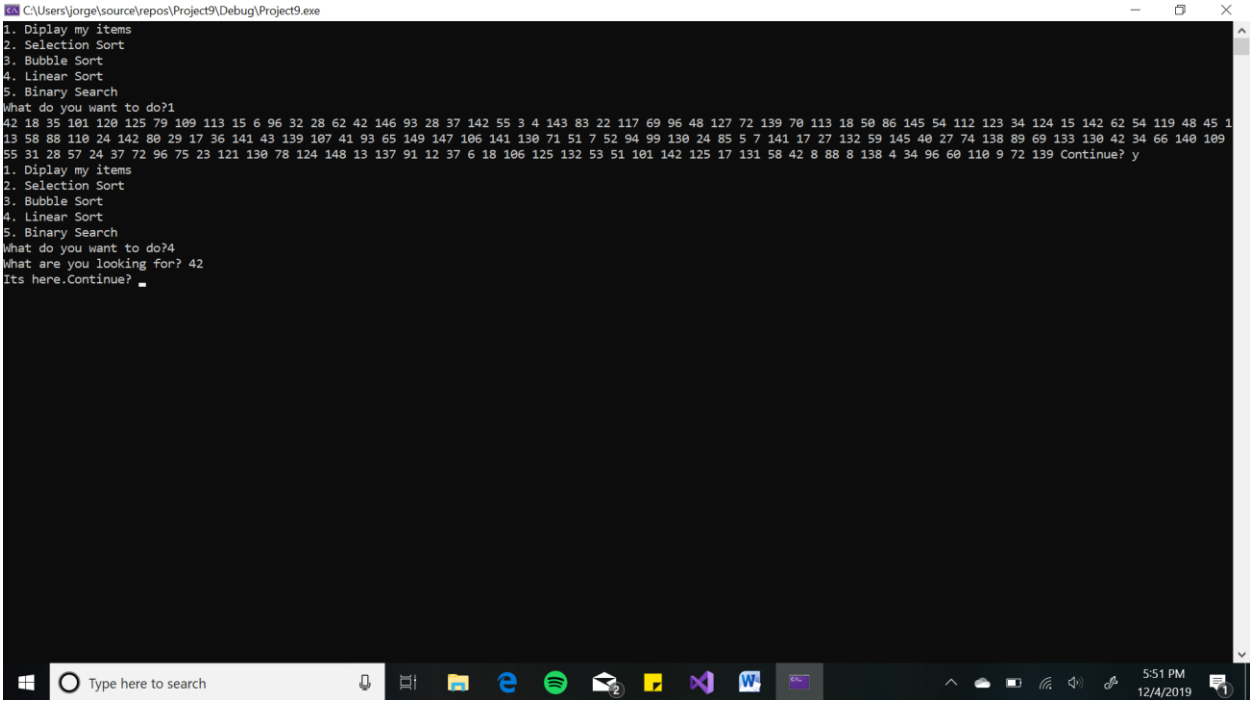
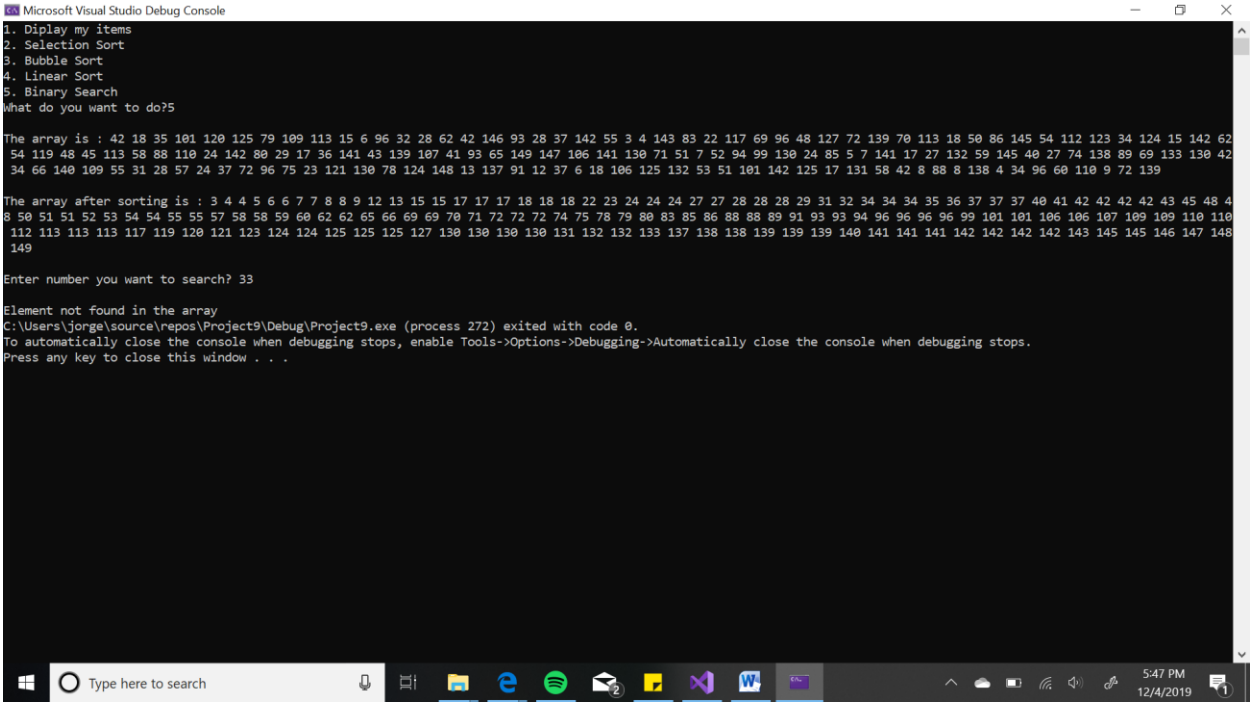


Microsoft Visual Studio Debug Console
4. Linear Sort
5. Binary Search
What do you want to do?2
The array is : 42 18 35 101 120 125 79 109 113 15 6 96 32 28 62 42 146 93 28 37 142 55 3 4 143 83 22 117 69 96 48 127 72 139 70 113 18 50 86 145 54 112 123 34 124 15 142 62 54 119 48 45 113 58 88 110 24 142 80 29 17 36 141 43 139 107 41 93 65 149 147 106 141 130 71 51 7 52 94 99 130 24 85 5 7 141 17 27 132 59 145 40 27 74 138 89 69 133 130 42 34 66 140 109 55 31 28 57 24 37 72 96 75 23 121 130 78 124 148 13 137 91 12 37 6 18 106 125 132 53 51 101 142 125 17 131 58 42 8 88 8 138 4 34 96 60 110 9 72 139
The array after sorting is : 3 4 4 5 6 6 7 7 8 8 9 12 13 15 15 17 17 18 18 22 23 24 24 24 27 27 28 28 28 29 31 32 34 34 34 35 36 37 37 37 40 41 42 42 42 42 43 45 48 48 50 51 51 52 53 54 54 55 55 57 58 58 59 60 62 62 65 66 69 69 70 71 72 72 72 74 75 78 79 80 83 85 86 88 88 89 91 93 93 94 96 96 96 96 99 101 101 106 106 107 109 109 110 110 112 113 113 113 117 119 120 121 123 124 124 125 125 125 127 130 130 130 130 131 132 132 133 137 138 138 139 139 139 140 141 141 141 142 142 142 142 143 145 145 146 147 148 149 Continue? y
1. Diplay my items
2. Selection Sort
3. Bubble Sort
4. Linear Sort
5. Binary Search
What do you want to do?3
Numbers in array:
3 4 4 5 6 6 7 7 8 8 9 12 13 15 15 17 17 17 18 18 18 22
23 24 24 24 27 27 28 28 28 29 31 32 34 34 34 35 36 37 37 37 40
41 42 42 42 42 43 45 48 48 50 51 51 52 53 54 54 55 55 57 58 58 59
60 62 62 65 66 69 69 70 71 72 72 72 74 75 78 79 80 83 85 86 88
88 89 91 93 93 94 96 96 96 96 99 101 101 106 106 107 109 109 110 110 112 113
113 113 117 119 120 121 123 124 124 125 125 125 127 130 130 130 130 131 132 132 133
137 138 138 139 139 139 140 141 141 141 142 142 142 142 143 145 145 146 147 148 149
Sorted List:
3 4 4 5 6 6 7 7 8 8 9 12 13 15 15 17 17 17 18 18 18 22
23 24 24 24 27 27 28 28 28 29 31 32 34 34 34 35 36 37 37 37 40
41 42 42 42 42 43 45 48 48 50 51 51 52 53 54 54 55 55 57 58 58 59
60 62 62 65 66 69 69 70 71 72 72 72 74 75 78 79 80 83 85 86 88
88 89 91 93 93 94 96 96 96 96 99 101 101 106 106 107 109 109 110 110 112 113
113 113 117 119 120 121 123 124 124 125 125 125 127 130 130 130 130 131 132 132 133
137 138 138 139 139 139 140 141 141 141 142 142 142 142 143 145 145 146 147 148 149
Number of passes taken to sort the list:150
C:\Users\jorge\source\repos\Project9\Debug\Project9.exe (process 47008) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
Type here to search
5:43 PM
12/4/2019


C:\Users\jorge\source\repos\Project9\Debug\Project9.exe
1. Diplay my items
2. Selection Sort
3. Bubble Sort
4. Linear Sort
5. Binary Search
What do you want to do?1
42 18 35 101 120 125 79 109 113 15 6 96 32 28 62 42 146 93 28 37 142 55 3 4 143 83 22 117 69 96 48 127 72 139 70 113 18 50 86 145 54 112 123 34 124 15 142 62 54 119 48 45 1
13 58 88 110 24 142 80 29 17 36 141 43 139 107 41 93 65 149 147 106 141 130 71 51 7 52 94 99 130 24 85 5 7 141 17 27 132 59 145 40 27 74 138 89 69 133 130 42 34 66 140 109
55 31 28 57 24 37 72 96 75 23 121 130 78 124 148 13 137 91 12 37 6 18 106 125 132 53 51 101 142 125 17 131 58 42 8 88 8 138 4 34 96 60 110 9 72 139 Continue? y
1. Diplay my items
2. Selection Sort
3. Bubble Sort
4. Linear Sort
5. Binary Search
What do you want to do?4
What are you looking for? 42
Its here.Continue?
Type here to search
5:51 PM
12/4/2019


Microsoft Visual Studio Debug Console
1. Diplay my items
2. Selection Sort
3. Bubble Sort
4. Linear Sort
5. Binary Search
What do you want to do?5
The array is : 42 18 35 101 120 125 79 109 113 15 6 96 32 28 62 42 146 93 28 37 142 55 3 4 143 83 22 117 69 96 48 127 72 139 70 113 18 50 86 145 54 112 123 34 124 15 142 62
54 119 48 45 113 58 88 110 24 142 80 29 17 36 141 43 139 107 41 93 65 149 147 106 141 130 71 51 7 52 94 99 130 24 85 5 7 141 17 27 132 59 145 40 27 74 138 89 69 133 130 42
34 66 140 109 55 31 28 57 24 37 72 96 75 23 121 130 78 124 148 13 137 91 12 37 6 18 106 125 132 53 51 101 142 125 17 131 58 42 8 88 8 138 4 34 96 60 110 9 72 139
The array after sorting is : 3 4 4 5 6 6 7 7 8 8 9 12 13 15 15 17 17 17 18 18 18 22 23 24 24 24 27 27 28 28 28 29 31 32 34 34 34 35 36 37 37 37 40 41 42 42 42 42 43 45 48 4
8 50 51 51 52 53 54 54 55 55 57 58 58 59 60 62 62 65 66 69 69 70 71 72 72 72 74 75 78 79 80 83 85 86 88 88 89 91 93 93 94 96 96 96 96 99 101 101 106 106 107 109 109 110 110
112 113 113 113 117 119 120 121 123 124 124 125 125 125 127 130 130 130 130 131 132 132 133 137 138 138 139 139 139 140 141 141 141 142 142 142 142 143 145 145 146 147 148
149
Enter number you want to search? 33
Element not found in the array
C:\Users\jorge\source\repos\Project9\Debug\Project9.exe (process 272) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
Type here to search
5:47 PM
12/4/2019