

Instructions: Work on homework assignments to further familiarize yourself with the topics in the class. The answers are provided for these problems. You can work with other students as desired. Turn in your work on canvas to be given a grade for completion (homework will not be checked for correctness; you need to verify this yourself.)

Upload each homework assignment to its own “dropbox” on Canvas.

This document is not formatted to be written on; do your homework on a separate sheet of paper.

Identify the “Big-O” growth rate value for each of the following.

1. GetOrder in Python:

```
1 def GetOrder( x, y ):
2     if( x < y ):     return -1
3     elif ( x > y ): return 1
4     else:           return 0
```

2. Selection Sort in C:¹

```
1 int i, j, n;
2
3 for (j = 0; j < n-1; j++)
4 {
5     int iMin = j;
6
7     for (i = j+1; i < n; i++)
8     {
9         if (a[i] < a[iMin])
10            iMin = i;
11    }
12
13    if (iMin != j)
14        swap(a[j], a[iMin]);
15 }
```

¹From https://en.wikipedia.org/wiki/Selection_sort

3. Linked List Clear in C++

```
1 void LinkedList<T>::Clear()
2 {
3     while ( m_ptrFirst != nullptr )
4     {
5         PopFront();
6     }
7 }
```

4. Vector Clear in C++

```
1 void Vector::Clear()
2 {
3     if ( m_data != nullptr )
4     {
5         delete [] m_data;
6         m_data = nullptr;
7     }
8 }
```

5. Vector Resize in C++

```
1 void Vector::Resize()
2 {
3     int newSize = m_arraySize + 10;
4
5     // Create bigger array
6     string* newArray = new string[ newSize ];
7
8     // Copy elements over
9     for ( int i = 0; i < m_arraySize; i++ )
10    {
11        newArray[i] = m_data[i];
12    }
13
14    delete [] m_data;           // Delete old space
15    m_data = newArray;         // Update pointer
16    m_arraySize = newSize;     // Update array size
17 }
```

Answer key

1. $O(1)$
2. $O(n^2)$
3. $O(n)$
4. $O(1)$
5. $O(n)$