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Data Structures & Algorithms

Lab 5

Question 3:

Show the big O runtime formula for each of the following. If the parameter is a List, show your

solution for both ArrayList and for LinkedList.

1)

void meth1 (int n)

{ for (int i=0; i<n; i++)

for (int j=0; j<100000; j++)

System.out.println (i+j);

}

The Runtime Big O notation is O(n^2)

2)

void meth2 (int n)

{ for (int i=0; i<n; i++)

for (int j=0; j<i; j++)

System.out.println (i+j);

}

The Runtime Big O notation is O(n^2)

3)

void meth3(List <Integer> numbers)

{

for (int i=0; i< numbers.size(); i++)

if (numbers.get(i) < 0)

numbers.set (i, 0);

}

For an ArrayList: O(n)

For a LinkedList O(n^2)

The LinkedLists’ get() method is not as efficient (hidden loop).

4)

int meth4 (int n)

{

if (n<2)

return 1;

return meth4(n-1) + meth4(n-2);

}

The Runtime Big O notation is O(n^2)

5)

void meth5(int i)

{

while (i > 0)

{

if (i % 2 == 0)

{

System.out.println(0);

}

else

{

System.out.println(1);

}

i = i / 2;

}

}

The Runtime Big O notation is O(log(n))