<html><head></head><body><pre style="word-wrap: break-word; white-space: pre-wrap;">Assignment #3

Due Dates: Wednesday, September 20 at 11:59pm

Submit: eLearning

Late Policy: -10 points per hour late

Instructions: This is an individual assignment. Answers should be your own work.

Chapter 3

10 points
1. Linked lists and arrays:
    a. What are some advantages of linked lists versus arrays?

    b. What are some advantages of arrays versus linked lists?

15 points
2. What is the Big-O running time of the following code fragment?
    Assume lst1 has N items, and lst2 is initially empty.

   public static void add(List<Integer> lst1, List<Integer> lst2)
   {
      for (Integer x : lst1)
         lst2.add(0, x);   // add to front
   }

   a. If an ArrayList is passed for lst1 and lst2. Explain your answer.
   b. If a LinkedList is passed for lst1 and lst2. Explain your answer.

15 points
3. What is the Big-O running time of the following code fragment?

   public static void erase(List<Integer> lst)
   {
      Iterator<Integer> itr = lst.iterator();

      while (itr.hasNext())
      {
         Integer x = itr.next();
         itr.remove();
      }

   }

   a. If an ArrayList is passed for lst. Explain your answer.
   b. If a LinkedList is passed for lst. Explain your answer.

15 points
4. What is the Big-O running time of the following code fragment?
    Assume lst1 has N items, and lst2 has N items.

   public static int Count(List<Integer> lst1, List<Integer> lst2)
   {
      Iterator<Integer> itr1 = lst1.iterator();

      int count=0;
      while (itr1.hasNext())
      {
         Integer x = itr1.next();

         Iterator<Integer> itr2 = lst2.iterator();
         while (itr2.hasNext())
            if (x.equals(itr2.next()))
               count++;
      }
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```
      return count;
   }
```

a. If an ArrayList is passed for lst1 and lst2. Explain your answer.
b. If a LinkedList is passed for lst1 and lst2. Explain your answer.

15 points
5. What is the Big-O running time of the following code fragment?

```
      public static int calc( List&lt;Integer&gt; lst )
      {
         int count = 0;
         int N = lst.size();

         for ( int i=0; i&lt;N; i++)
         {
            if (lst.get(i) &gt; 0)
               sum += lst.get(i);
            else
               sum += lst.get(i) * lst.get(i);
         }
         return sum;
      }
```

a. If an ArrayList is passed for lst. Explain your answer.
b. If a LinkedList is passed for lst. Explain your answer.

15 points
6. Suppose a Java method receives a List<Integer> and reverses the order of the items it contains by removing each item from the front of the list and pushing it onto a Stack<Integer>, and then popping the items from the stack and inserting each item to the end of the list.
What is the expected Big-O running time if:
a. If an ArrayList is passed. Explain your answer.
b. If a LinkedList is passed. Explain your answer.

15 points
7. Show each step of converting a+b*c+(d-e) from infix to postfix notation, using the algorithm described in the textbook that uses a stack.

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hw3.doc (.doc can be .txt, .jpg, etc.)

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