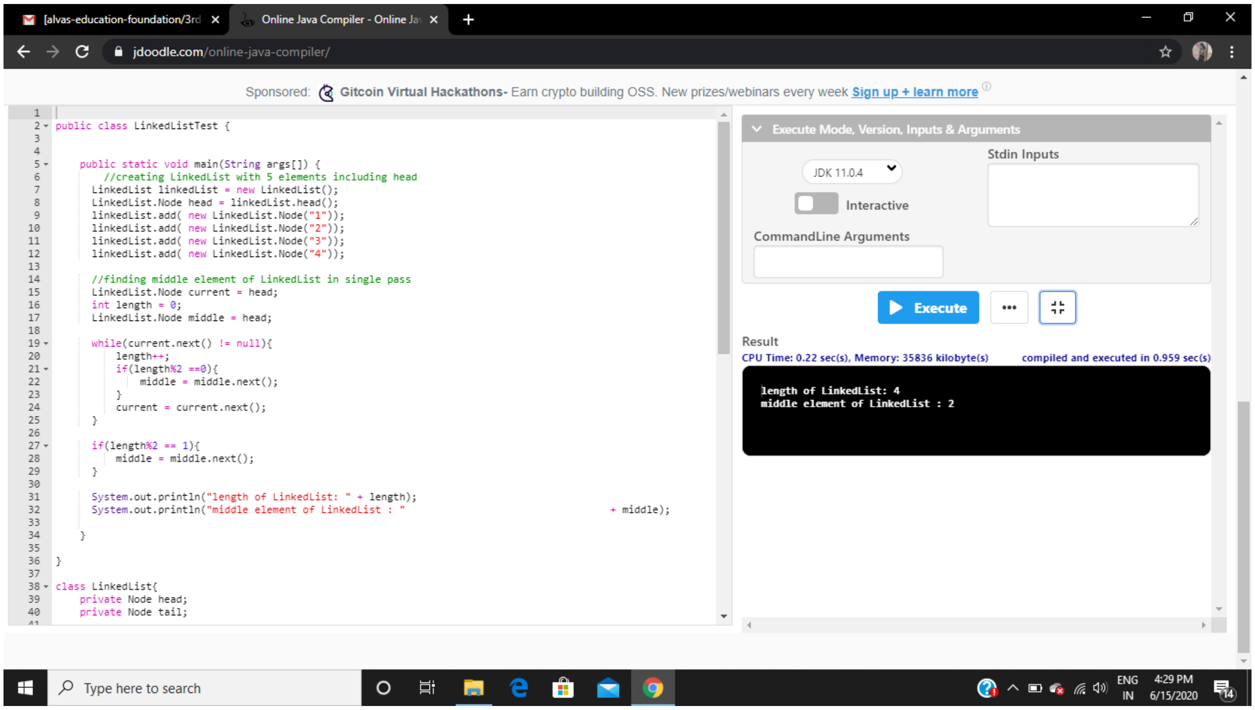
Write a Java Program to Find the Middle Node of a Linked list in a Single-pass

```
public class LinkedListTest {
  public static void main(String args[]) {
    //creating LinkedList with 5 elements including head
   LinkedList linkedList = new LinkedList();
   LinkedList.Node head = linkedList.head();
   linkedList.add( new LinkedList.Node("1"));
   linkedList.add( new LinkedList.Node("2"));
   linkedList.add( new LinkedList.Node("3"));
   linkedList.add( new LinkedList.Node("4"));

   //finding middle element of LinkedList in single pass
   LinkedList.Node current = head;
   int length = 0;
   LinkedList.Node middle = head;

   while(current.next() != null){
     length++;
     if(length%2 ==0){
       middle = middle.next();
     }
```

```
          current = current.next();
      }

      if(length%2 == 1){
          middle = middle.next();
      }

      System.out.println("length of LinkedList: " + length);
      System.out.println("middle element of LinkedList : " + middle);

    }

}

class LinkedList{
    private Node head;
    private Node tail;

    public LinkedList(){
        this.head = new Node("head");
        tail = head;
    }
```

```
public Node head(){
    return head;
}

public void add(Node node){
    tail.next = node;
    tail = node;
}

public static class Node{
    private Node next;
    private String data;

    public Node(String data){
        this.data = data;
    }

    public String data() {
        return data;
    }

    public void setData(String data) {
            this.data = data;
        }

        public Node next() {
            return next;
        }

        public void setNext(Node next) {
            this.next = next;
        }

        public String toString(){
            return this.data;
        }
    }
}
```



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```java

public class LinkedListTest {


    public static void main(String args[]) {
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      LinkedList.Node head = linkedList.head();
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      //finding middle element of LinkedList in single pass
      LinkedList.Node current = head;
      int length = 0;
      LinkedList.Node middle = head;

      while(current.next() != null){
          length++;
          if(length%2 ==0){
              middle = middle.next();
          }
          current = current.next();
      }

      if(length%2 == 1){
          middle = middle.next();
      }

      System.out.println("length of LinkedList: " + length);
      System.out.println("middle element of LinkedList : "                                 + middle);

    }

}

class LinkedList{
    private Node head;
    private Node tail;
```

JDK 11.0.4

Interactive: off

CommandLine Arguments:

CPU Time: 0.22 sec(s), Memory: 35836 kilobyte(s)   compiled and executed in 0.959 sec(s)

```
length of LinkedList: 4
middle element of LinkedList : 2
```