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15-121 Fall 2018 Quiz 5

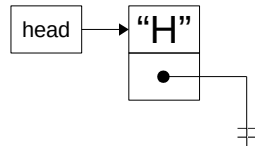
Up to 20 minutes. No calculators, no notes, no books, no computers. Show your work!
There are questions on *both sides* of this paper.

1. Consider the following program that creates a linked list. You may assume that the `ListNode` class exists and was defined as in class.

```
1 public class Quiz5CT {
2
3     public static void main(String[] args) {
4         ListNode head = null;
5         ListNode tmp = null;
6
7         head = new ListNode("H");
8         head.next = new ListNode("A");
9         tmp = new ListNode("T");
10        tmp.next = head;
11        head = tmp;
12        tmp = new ListNode("U");
13        tmp.next = head.next.next;
14        head.next.next = tmp;
15        head.next.next.next.data = "P";
16    }
17
18 }
```

Draw the state of the linked list after the execution each specified line of code. The first one is drawn for you.

- (a) After Line 7



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- (b) (3 points) After Line 8

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- (c) (3 points) After Line 11

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- (d) (2 points) After Line 14

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- (e) (2 points) After Line 15

2. (10 points) **Free Response:** Consider a file containing lines of characters separated by spaces. The number of characters per line is not fixed. Some lines don't contain anything. Write the public method `thirdLetterSum` which, given a filename, returns a string containing the concatenation of the **third** character from each line. If a line doesn't have a third character, then simply ignore it. If you would like, you may assume you can use the `public static Scanner getFileScanner(String filename)` method given in both the notes and the homework.

Consider this example. If `input.txt` contains the following:

```
a q d m e c j n h j c
p c o c h a a

w j g u t
t u
x q s x q e s
```

Then `thirdSum("input.txt")` would return `"dogs"`.