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**HW4**

**Sentence 1:**
Mr. Cotton said the terms of the emerging deal made it too risky and noted
that a Republican president succeeding Mr. Obama could decide not to honor
it.

```
Sentence:                                    Mr. Cotton said the terms of the emerging deal made
Annotating Mr. Cotton  as constit cat=np
Annotating said  as constit cat=vgroup
Annotating the terms  as constit cat=np
Annotating deal  as constit cat=np
Annotating made  as constit cat=vgroup
Annotating it  as constit cat=np
Annotating noted  as constit cat=vgroup
Annotating a Republican president  as constit cat=np
Annotating Mr. Obama  as constit cat=np
Annotating could decide  as constit cat=vgroup
Annotating honor  as constit cat=vgroup-inf
Annotating it as constit cat=np
```

In this sentence we have 11 correct phrases, 2 missed phrases and 1 Wrongly
identified group.

It incorrectly broke up Republican president succeeding Mr. Obama as two
different noun groups instead of one.

**Sentence 2:**
The basics of the Apple Watch have been known since September, but now, a
few weeks before the watchs arrival in stores, Apple has finally revealed how
much it will cost.

```
Sentence:                                  The basics of the Apple Watch have been known since
Annotating The basics  as constit cat=np
Annotating Apple Watch  as constit cat=np
Annotating have  as constit cat=vgroup
Annotating September as constit cat=np
Annotating a few weeks  as constit cat=np
Annotating the watch as constit cat=np
Annotating  as constit cat=np
Annotating s  as constit cat=vgroup
Annotating stores as constit cat=np
Annotating Apple  as constit cat=np
Annotating has  as constit cat=vgroup
Annotating it  as constit cat=np
```

```
Annotating will cost as constit cat=vgroup
```

In this sentence we have correctly labeled 8 groups, missed 5 labels, and got
1 label incorrect.

**Sentence 3:**
The cheapest model is the Apple Watch Sport, the one tailored to athletes,
which starts at $349

```
Sentence:                                The cheapest model is the Apple Watch Sport, the one
Annotating The cheapest model  as constit cat=np
Annotating is  as constit cat=vgroup
Annotating Apple Watch Sport as constit cat=np
Annotating the one  as constit cat=np
Annotating athletes as constit cat=np
Annotating starts  as constit cat=vgroup
```

This sentence has correctly labeled 6 different groups, and has missed 3
groups.

**Sentence 4:**
The MacBook also includes a trackpad with sensors that can detect how hard
a user is clicking.

```
Sentence:                                The MacBook also includes a trackpad with sensors th
Annotating MacBook  as constit cat=np
Annotating includes  as constit cat=vgroup
Annotating a trackpad  as constit cat=np
Annotating sensors  as constit cat=np
Annotating can detect  as constit cat=vgroup
Annotating a user  as constit cat=np
Annotating is clicking as constit cat=vgroup-pass
```

This sentence had 7 correct groups and has also missed 2 groups.

**Problem 2:** Here is the new chunkPatterns.txt used in order to accept perfect tenses, quantifiers, and pre-nomial nouns.

```
//  pattern set for noun and verb groups

pattern set chunks;

//  patterns for noun groups

ng :=  det-pos? [constit cat=q]? [constit cat=adj]* [constit cat=n]+ |
proper-noun |
[constit cat=pro];

det-pos     := [constit cat=det] |
[constit cat=det]? [constit cat=n number=singular] "'s";

proper-noun := ([token case=cap] | [undefinedCap])+;

when ng add [constit cat=np];

//  patterns for active verb groups

vg := [constit cat=tv] |
[constit cat=w] vg-inf |
tv-vbe vg-ving;

vg-inf := [constit cat=v] |
"be" vg-ving;

vg-ving := [constit cat=ving];

tv-vbe := "is" | "are" | "was" | "were" | "have" | "has";

vg-ven := [constit cat=ven] | tv-vbe?
"been" vg-ving;

when vg add [constit cat=vgroup];

//  patterns for passive verb groups

vg-pass := tv-vbe [constit cat=ven]+ vg-ving? |
[constit cat=w] "be" [constit cat=ven];

when vg-pass add [constit cat=vgroup-pass];

//  pattern for infinitival verb groups
```

```
to-vg := vg-inf;

when to-vg add [constit cat=vgroup-inf];
```

**Problem 3.**

1. No improvement on sentence one.

2. Improvement on sentence two. We now correctly identify "have been known"

```
Sentence:                              The basics of the Apple Watch have been known since
Annotating The basics  as constit cat=np
Annotating Apple Watch  as constit cat=np
Annotating have been known  as constit cat=vgroup-pass
Annotating September as constit cat=np
Annotating a few weeks  as constit cat=np
Annotating the watch as constit cat=np
Annotating s  as constit cat=vgroup
Annotating stores as constit cat=np
Annotating Apple  as constit cat=np
Annotating has  as constit cat=vgroup
Annotating it  as constit cat=np
Annotating will cost as constit cat=vgroup
```

3. No improvement on sentence 3.

4. No improvement on sentence 4.

**Problem 4.** These were found with Google ngram viewer.

**Example 1**:
"Traditionally, legislation **has rarely been passed** by a vote strictly along party lines."
American Government and Politics Today: The Essentials 2008 Pg 267.

**Example 2**:
"Respiratory arrest **has rarely been** seen in children and adolescents."

Advanced Therapy in Epilepsy pg 287.