Assume that English has the following phrase structure rules.

\[
\begin{align*}
S & \rightarrow DP \ VP \\
DP & \rightarrow D \ NP \\
NP & \rightarrow AP \ NP \\
NP & \rightarrow NP \ PP \\
\alpha & \rightarrow \alpha \text{ or } \alpha
\end{align*}
\]

Use the phrase structure rules above to parse the following sentences.

1. The slow awful class ended at the last moment.

```
 S
 /\  \
DP         VP
 /  \
the AP   VP PP
 /  \
slow  A  ended at the AP NP
     NP  
     A  NP
      N  
       A  N
        last minute
```
2. The class on some terrible problems bothered several students.

S

DP  VP

D  NP  V  DP

| the  NP  PP  bothered  D  NP

| N  P  DP  several  N

| class  on  D  NP  students

| some  AP  NP

| A  N  terrible problems

3. The dog said that the class amused the cats.

S

DP  VP

D  NP  VP  CP

| the  N  V  C  S

| dog  said  that  DP  VP

| D  NP  V  DP

| the  N  amused  D  NP

| class  the  N  cats
Each of the following strings can be parsed in exactly two ways with the phrase structure rules given above. For each, give those two parses.

1. A slow class on every topic ended.
2. The letter about a car from that country arrived.

3. The dog chased a cat under the table.
4. Many cats or dogs in this room jumped.

Note that the rule about or requires that the two things that are on either side of or are the same, and that they are both the same as the phrase that's made by the rule. So, for instance, if it's an NP that or is making out of the two things on either side of it, then those two things must themselves be NPs. If or only brings phrases together, then the only things it can make are phrases too. So, if it brings to VPs together, then it's going to be a VP that is created, and if it brings two PPs together, then it'll be a PP that is made. On the other hand, if or can bring two terminals together, then it will make another terminal from them. If that possibility exists, then there is a third parse available for this examples, and it is: