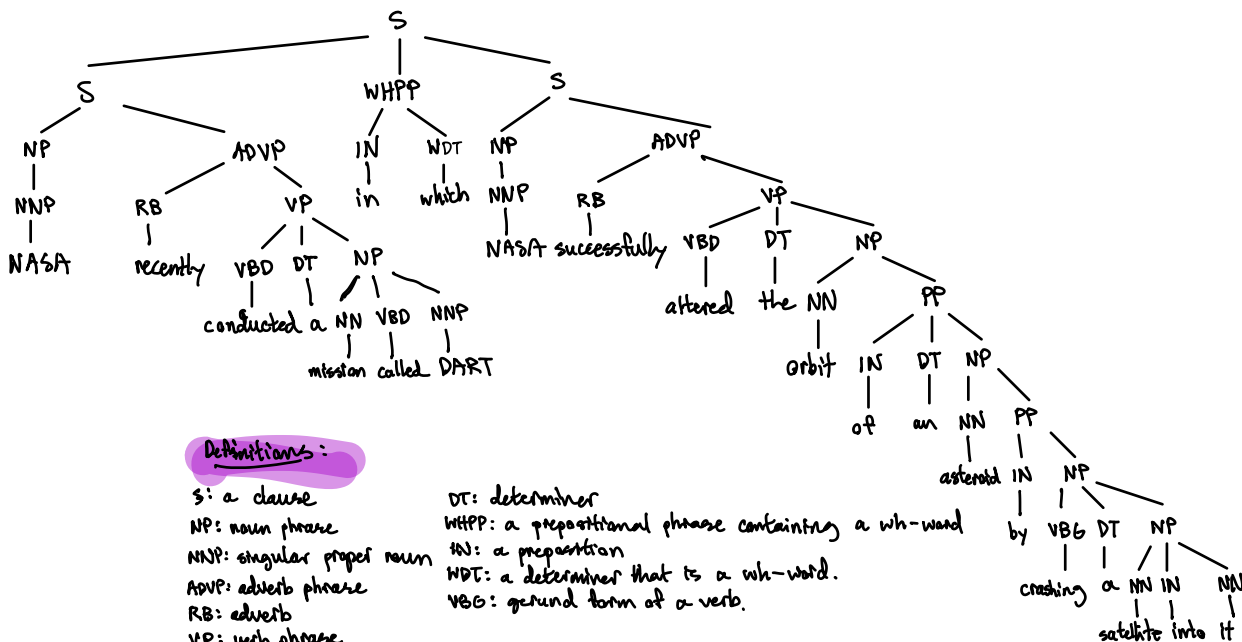**Sentence:** NASA recently conducted a mission called DART, in which NASA successfully altered the orbit of an asteroid by crashing a satellite into it.

PSG:

The PSG tree (selected labels):

```
                          S
        S              WHPP              S
      NP            ADVP  IN  WDT   NP        ADVP
     NNP          RB   VP  in  which NNP    RB    VP
    NASA      recently VBD DT  NP      NASA successfully VBD DT  NP
                   conducted a NN VBD NNP        altered the NN      PP
                            mission called DART          orbit  IN  DT  NP
                                                              of  an  NN   PP
                                                                  asteroid IN  NP
                                                                          by VBG DT  NP
                                                                           crashing a NN IN  NN
                                                                                  satellite into it
```
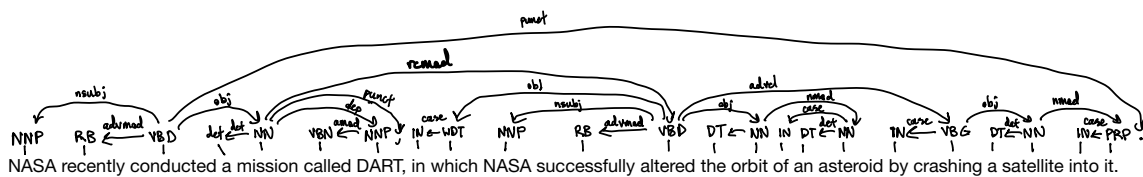
Definitions:

S: a clause
NP: noun phrase
NNP: singular proper noun
ADVP: adverb phrase
RB: adverb
VP: verb phrase
VBD: past tense verb

DT: determiner
WHPP: a prepositional phrase containing a wh-word
IN: a preposition
WDT: a determiner that is a wh-word.
VBG: gerund form of a verb.

Dependency Parse:

NASA recently conducted a mission called DART, in which NASA successfully altered the orbit of an asteroid by crashing a satellite into it.

Definitions:

nsubj: nominal subject relation
advmod: verb is modified by adverb
dobj: mission is direct object of conducted
det: determiner relation
punct: punctuation relation
dep: vague relation to show "mission" and "DART" are the same.
amod: adjective modifies a noun phrase
advcl: clause modifies a verb
nmod: nominal modifier; basically an attribute of an object.

case: case marking relation, denotes dependency
rcmod: relative modifier, relative clause that modifies a noun phrase.

SRL Parse:

All predicates:

- conducted   ARG0: NASA, ARG1: a mission called DART, etc. ARGM-TMP: recently
- called : ARG1: a mission, ARG2: DART
- altered : ARG0: NASA, ARG1: the orbit of an asteroid, ARGM-LOC: a mission called DART,
  R-ARGM-LOC: in which, ARGM-MNR: successfully, ARGM-MNR: by crashing a satellite into it
- crashing : ARG0: NASA, ARG1: a satellite, ARGM-DIR: into it

Definitions:

- ARG0: The agent performing the action
- ARG1: Passive actor
- ARG2: The instrument by which an action is performed.
- ARGM-TMP: When action was performed.
- ARGM-LOC: Where the action occurred.
- ARGM-MNR: How the action was performed
- R-ARGM-LOC: The R just says the phrase references the location.
- ARGM-DIR: Motion along a path

Pros/Cons:

PSG:

Pros: PSG can be performed reasonably well by a machine using rules. For my sentence
it was pretty clear how to split my sentences into phrases and tokens by consulting the
rules of certain tags.

Cons: Because the rules are rigid, parsing takes a long time. Furthermore, because my
sentence was complex I had to do frequent backtracking to make more logical parses.

Dependency Parsing:

Pros: Dependency Parsing directly shows the relations between words, not just how the
parsing is done. For example, 'mission' and 'DART' are shown to be related instead of
leaving the relation implicit.

Cons: Super convoluted for some relations, such as the case relation and some the rcmod
and advcl relations. Also really hard to draw neatly.

SRL:

Pros: Machine learning! Don't have to figure out the parsing by hand. Also is pretty accurate, and since it gives semantic roles we gain new insights about the sentence.

Cons: Probably isn't perfectly accurate and it requires training an ML model.