

## N-gramas sintácticos

### Código

```
import stanza

nlp = stanza.Pipeline(lang='en',
processors='tokenize,mwt,pos,lemma,depparse')
doc = nlp('The ultimate goal of the Artemis program is to return humans to
the moon and make many trips, building infrastructure that allows crews to
spend more time there.')

dependencies = []

for sent in doc.sentences:
    for word in sent.words:
        if word.head > 0:
            head = sent.words[word.head-1].text
        else:
            head = 'root'

        dependencie = word.deprel + '(' + head + '-' + str(word.head) + ',
' + word.text + '-' + str(word.id) + ')'
        dependencies.append(dependencie)

with open("dependencies.txt", "w") as f:
    for dependencie in dependencies:
        f.write(dependencie)
        f.write("\n")
```

### Salida

```
det(goal-3, The-1)
amod(goal-3, ultimate-2)
nsubj(is-8, goal-3)
case(program-7, of-4)
det(program-7, the-5)
compound(program-7, Artemis-6)
nmod(goal-3, program-7)
root(root-0, is-8)
mark(return-10, to-9)
ccomp(is-8, return-10)
obj(return-10, humans-11)
case(moon-14, to-12)
det(moon-14, the-13)
obl(return-10, moon-14)
cc(make-16, and-15)
conj(return-10, make-16)
amod(trips-18, many-17)
obj(make-16, trips-18)
punct(building-20, ,-19)
advcl(make-16, building-20)
obj(building-20, infrastructure-21)
nsubj(allows-23, that-22)
acl:relcl(infrastructure-21, allows-23)
obj(allows-23, crews-24)
mark(spend-26, to-25)
xcomp(allows-23, spend-26)
amod(time-28, more-27)
obj(spend-26, time-28)
advmod(spend-26, there-29)
punct(is-8, .-30)
```

```

*****Size: 2
goal[The] 1
goal[ultimate] 1
goal[program] 1
program[of] 1
program[the] 1
program[Artemis] 1
is[goal] 1
is[return] 1
is[.] 1
return[to] 1
return[humans] 1
return[moon] 1
return[make] 1
moon[to] 1
moon[the] 1
make[and] 1
make[trips] 1
make[building] 1
trips[many] 1
building[\\,] 1
building[infrastructure] 1
infrastructure[allows] 1
allows[that] 1
allows[crews] 1
allows[spend] 1
spend[to] 1
spend[time] 1
spend[there] 1
time[more] 1

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*****Size: 3
goal[The,ultimate] 1
goal[The,program] 1
goal[ultimate,program] 1
program[of,the] 1
program[of,Artemis] 1
program[the,Artemis] 1
is[goal,return] 1
is[goal,.] 1
is[return,.] 1
return[to,humans] 1
return[to,moon] 1
return[to,make] 1
return[humans,moon] 1
return[humans,make] 1
return[moon,make] 1
moon[to,the] 1
make[and,trips] 1
make[and,building] 1
make[trips,building] 1
building[\\,,infrastructure] 1
allows[that,crews] 1
allows[that,spend] 1
allows[crews,spend] 1
spend[to,time] 1
spend[to,there] 1
spend[time,there] 1
is[goal[The]] 1
is[goal[ultimate]] 1
is[goal[program]] 1
goal[program[of]] 1
goal[program[the]] 1
goal[program[Artemis]] 1
is[return[to]] 1
is[return[humans]] 1

```

```

*****Size: 7
is[goal[The,ultimate,program],return,.] 1
goal[The,ultimate,program[of,the,Artemis]] 1
is[goal[The,ultimate],return[to,.] 1
is[goal[The,program],return[to,.] 1
is[goal[ultimate,program],return[to,.] 1
is[goal[The,ultimate,program],return[to]] 1
is[goal[The,ultimate],return[humans,.] 1
is[goal[The,program],return[humans,.] 1
is[goal[ultimate,program],return[humans,.] 1
is[goal[The,ultimate,program],return[humans]] 1
is[goal[The,ultimate],return[moon,.] 1
is[goal[The,program],return[moon,.] 1
is[goal[ultimate,program],return[moon,.] 1
is[goal[The,ultimate,program],return[moon]] 1
is[goal[The,ultimate],return[make,.] 1
is[goal[The,program],return[make,.] 1
is[goal[ultimate,program],return[make,.] 1
is[goal[The,ultimate,program],return[make]] 1
is[goal[The],return[to,humans,.] 1
is[goal[ultimate],return[to,humans,.] 1
is[goal[program],return[to,humans,.] 1
is[goal[The,ultimate],return[to,humans]] 1
is[goal[The,program],return[to,humans]] 1
is[goal[ultimate,program],return[to,humans]] 1
is[goal[The],return[to,moon,.] 1
is[goal[ultimate],return[to,moon,.] 1
is[goal[program],return[to,moon,.] 1
is[goal[The,ultimate],return[to,moon]] 1
is[goal[The,program],return[to,moon]] 1
is[goal[ultimate,program],return[to,moon]] 1
is[goal[The],return[to,make,.] 1
is[goal[ultimate],return[to,make,.] 1
is[goal[program],return[to,make,.] 1
is[goal[The,ultimate],return[to,make]] 1

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