CE314 Assignment 2 Report  
Student regNo: **17306038**  
Pair Partner regNo: 1603977

**Q1. Extending a Grammar**

**a)** Theses are the rules which has been added into the grammar.  
To implement

1) S1: Put the **block** on the **table**

N -> ‘block’ | ‘table’

S -> VP

2) S2: **Bob** chased a bear in the park **along** the **river**

PropN -> ‘Bob’

P -> ‘in’ | ‘along’

N -> ‘river’

3) Bill saw **Bob** **chase** the angry **furry** **dog**

PropN -> ‘’Bob’

V -> ‘chase’

Adj -> ‘furry’

N -> ‘dog’

**b)**

There are total 7 derivations have been derived from all three sentences.

**S1**:

Put the **block** on the **table**

**Derivations: 1**

**Output**:

(S (VP Put

(NP the block)

(PP on

(NP the table))))

**S2:**

**Bob** chased a bear in the park **along** the **river**

**Total Derivations: 5**

**Output:**

|  |  |
| --- | --- |
| **Derivations:** 1  (S (NP Bob)  (VP chased  (NP a bear)  (PP in  (NP (NP the park)  (PP along  (NP the river)))))) | **Derivations:** 2  (S (NP Bob)  (VP chased  (NP (NP a bear)  (PP in  (NP the park)))  (PP along  (NP the river)))) |
| **Derivations:** 3  (S (NP Bob)  (VP chased  (NP (NP a bear)  (PP in  (NP (NP the park)  (PP along  (NP the river))))))) | **Derivations:** 4  (S (NP Bob)  (VP chased  (NP (NP (NP a bear)  (PP in  (NP the park)))  (PP along  (NP the river))))) |
| Derivation 5  (S (NP Bob)  (VP chased  (NP (NP (NP a bear)  (PP in  (NP the park)))  (PP along  (NP the river))))) |  |

**S3:**

Bill saw **Bob** **chase** the angry **furry** **dog**

**Output:**

(S (NP Bill)

(VP saw

(NP Bob)

(VP chase

(NP the angry furry dog))))

**Q2. Parsing Quality**

S4. An bear eat an squirrel

S5. The dogs eats

a) No, both given sentences consist grammatical mistakes.

**Correct Sentences Version:**

S4. A bear eats a squirrel

S5. The dogs eat

**A bear eats a squirrel - using chat parser**

(S

(NP (Det a) (Nom(N bear)))

(VP (V eats) (NP(Det a) (Nom(N squirrel)))))

**The dogs eat: using Shift Reduce Parser**

Not derivatives.

Warning: VP -> VP PP will never be used

**Q4. Calculating similarity between words**

**Part A)**

The following output is produced in a text file BioSim-100-predicted.txt.

------------------------------------------------------------------------------

word1 | word2 | gold | path similarity |

------------------------------------------------------------------------------

old | new | 1.58 | 0

smart | intelligent | 9.2 | 0.25

hard | difficult | 8.77 | 1.0

happy | cheerful | 9.55 | 0

hard | easy | 0.95 | 0

fast | rapid | 8.75 | 0.25

happy | glad | 9.17 | 1.0

short | long | 1.23 | 0.25

stupid | dumb | 9.58 | 0

weird | strange | 8.93 | 0

wide | narrow | 1.03 | 0

bad | awful | 8.42 | 0

easy | difficult | 0.58 | 0

bad | terrible | 7.78 | 0

hard | simple | 1.38 | 0

smart | dumb | 0.55 | 0.25

insane | crazy | 9.57 | 0

happy | mad | 0.95 | 0

large | huge | 9.47 | 0

hard | tough | 8.05 | 1.0

new | fresh | 6.83 | 1.0

sharp | dull | 0.6 | 0

quick | rapid | 9.7 | 0.125

dumb | foolish | 6.67 | 0

wonderful | terrific | 8.63 | 1.0

strange | odd | 9.02 | 0

happy | angry | 1.28 | 0

narrow | broad | 1.18 | 0.25

simple | easy | 9.4 | 0

old | fresh | 0.87 | 0

apparent | obvious | 8.47 | 0

inexpensive | cheap | 8.72 | 1.0

nice | generous | 5 | 0

weird | normal | 0.72 | 0.1111111111111111

weird | odd | 9.2 | 0

bad | immoral | 7.62 | 0

sad | funny | 0.95 | 0

wonderful | great | 8.05 | 0

guilty | ashamed | 6.38 | 0

beautiful | wonderful | 6.5 | 0

confident | sure | 8.27 | 0

dumb | dense | 7.27 | 1.0

large | big | 9.55 | 1.0

nice | cruel | 0.67 | 0

impatient | anxious | 6.03 | 0

big | broad | 6.73 | 0

strong | proud | 3.17 | 0

unnecessary | necessary | 0.63 | 0

restless | young | 1.6 | 0

dumb | intelligent | 0.75 | 0

bad | great | 0.35 | 0.1

difficult | simple | 0.87 | 0

necessary | important | 7.37 | 0

bad | terrific | 0.65 | 0

mad | glad | 1.45 | 0

honest | guilty | 1.18 | 0

easy | tough | 0.52 | 0

easy | flexible | 4.1 | 0

certain | sure | 8.42 | 1.0

essential | necessary | 8.97 | 1.0

different | normal | 1.08 | 0

sly | clever | 7.25 | 0

crucial | important | 8.82 | 1.0

harsh | cruel | 8.18 | 0

childish | foolish | 5.5 | 0

scarce | rare | 9.17 | 0

friendly | generous | 5.9 | 0

fragile | frigid | 2.38 | 0

long | narrow | 3.57 | 0.25

big | heavy | 6.18 | 1.0

rough | frigid | 2.47 | 0.2

bizarre | strange | 9.37 | 0

illegal | immoral | 4.28 | 0

bad | guilty | 4.2 | 0

modern | ancient | 0.73 | 0.3333333333333333

new | ancient | 0.23 | 0

dull | funny | 0.55 | 0.25

happy | young | 2 | 0

easy | big | 1.12 | 0

great | awful | 1.17 | 0

tiny | huge | 0.6 | 0

polite | proper | 7.63 | 0

modest | ashamed | 2.65 | 0

exotic | rare | 8.05 | 0

dumb | clever | 1.17 | 0

delightful | wonderful | 8.65 | 0

noticeable | obvious | 8.48 | 0

afraid | anxious | 5.07 | 0

formal | proper | 8.02 | 0

dreary | dull | 8.25 | 0

delightful | cheerful | 6.58 | 0

unhappy | mad | 5.95 | 0

sad | terrible | 5.4 | 0

sick | crazy | 3.57 | 1.0

violent | angry | 6.98 | 0

laden | heavy | 5.9 | 0.25

dirty | cheap | 1.6 | 0.25

elastic | flexible | 7.78 | 1.0

hard | dense | 5.9 | 0

recent | new | 7.05 | 0

bold | proud | 3.97 | 0

**Part B)**

The part produces the following output in the text file name: **original-pairs.txt**As the output file has very long I have just pasted upper result only.

chapter tom 0.08333333333333333

chapter answer 0.125

chapter whats 0

chapter gone 0

chapter boy 0.08333333333333333

chapter wonder 0.25

chapter old 0.1

chapter lady 0.07692307692307693

chapter pulled 0

chapter spectacle 0.125

chapter looked 0

chapter room 0.25

chapter put 0.125

chapter seldom 0

chapter never 0

chapter small 0.1

chapter thing 0.25

chapter state 0.14285714285714285

chapter pair 0.25

chapter pride 0.125

chapter heart 0.125

chapter built 0

chapter style 0.16666666666666666

chapter service 0.16666666666666666

chapter could 0

chapter seen 0

chapter stovelids 0

chapter well 0.16666666666666666

chapter perplexed 0

chapter moment 0.2

chapter said 0

chapter fiercely 0

chapter still 0.09090909090909091

chapter loud 0

chapter enough 0.14285714285714285

chapter furniture 0.07142857142857142

chapter hear 0

chapter lay 0.16666666666666666

chapter get 0.07692307692307693

chapter hold 0.125

chapter ill 0.08333333333333333

chapter 0

chapter finish 0.25

4 C)

**Part C)**

The part produces the following output in the text file name: **original-pairs-hypernyms.txt**

As the output file has very long I have just pasted upper result only.

chapter tom 0.08333333333333333 section Black 0.2

chapter answer 0.125 section statement 0.2

chapter whats 0 section male 0.2

chapter gone 0 section astonishment 0.1111111111111111

chapter boy 0.08333333333333333 section past 0.2

chapter wonder 0.25 section woman 0.125

chapter old 0.1 section move 0.25

chapter lady 0.07692307692307693 section sight 0.16666666666666666

chapter pulled 0 section area 0.5

chapter spectacle 0.125 section option 0.16666666666666666

chapter looked 0 section body\_part 0.25

chapter room 0.25 section situation 0.14285714285714285

chapter put 0.125 section administrative\_district 0.2

chapter seldom 0 section set 0.2

chapter never 0 section feeling 0.25

chapter small 0.1 section intuition 0.2

chapter thing 0.25 section make 0.25

chapter state 0.14285714285714285 section property 0.3333333333333333

chapter pair 0.25 section work 0.2

chapter pride 0.125 section perceive 0.2

chapter heart 0.125 section excavation 0.16666666666666666

chapter built 0 section confuse 0.16666666666666666

chapter style 0.16666666666666666 section point 0.3333333333333333

chapter service 0.16666666666666666 section express 0.2

chapter could 0 section photograph 0.2

chapter seen 0 section relative\_quantity 0.14285714285714285

chapter stovelids 0 section furnishing 0.14285714285714285

chapter well 0.16666666666666666 section perceive 0.2

chapter perplexed 0 section song 0.25

chapter moment 0.2 section return 0.2

chapter said 0 section grasping 0.2

chapter fiercely 0 section disorder 0.16666666666666666

chapter still 0.09090909090909091 section digit 0.16666666666666666

chapter loud 0 section decorativeness 0.1111111111111111

chapter enough 0.14285714285714285 section case 0.14285714285714285

chapter furniture 0.07142857142857142 section movement 0.25

chapter hear 0 section hit 0.2

chapter lay 0.16666666666666666 section bedroom\_furniture 0.1111111111111111

chapter get 0.07692307692307693 section cleaning\_implement 0.125

chapter hold 0.125 section bodily\_process 0.14285714285714285chapter ill 0.08333333333333333 section add 0.16666666666666666

**4 Part d)**

10 most similar pairs that you found for text1.txt, the following output is produced in top.txt

Word1 | Word2 | Similarity

---------------------------------------------------

gone | get | 1.0

gone | went | 1.0

gone | broke | 1.0

gone | got | 1.0

gone | break | 1.0

gone | work | 1.0

gone | go | 1.0

gone | move | 1.0

gone | run | 1.0

gone | moved | 1.0