

# 复查测验提交: Homework 4

用户	生物医学工程学院 吉泓光
课程	自然语言处理
测试	Homework 4
已开始	24-4-30 上午8:53
已提交	24-5-7 下午3:37
截止日期	24-5-7 下午11:59
状态	已完成
尝试分数	得 100 分，满分 110 分
已用时间	174 小时 44 分钟
显示的结果	所有答案, 已提交的答案, 正确答案

问题 1

得 0 分，满分 10 分

Select all correct statements

- 所选

答案:

✔

Mildly context-sensitive grammars are more expressive than PCFGs.

✘

In span-based parsing, we only need to compute scores for a small portion of possible spans, and use the CKY algorithm to find the highest-scoring tree.

✔

Constituency parsing can be casted to a sequence-labeling task. The main advantage is the faster parsing speed.

There are no polynomial-time parsing algorithms for Mildly context-sensitive grammars

答案:

✔

Mildly context-sensitive grammars are more expressive than PCFGs.

In span-based parsing, we only need to compute scores for a small portion of possible spans, and use the CKY algorithm to find the highest-scoring tree.

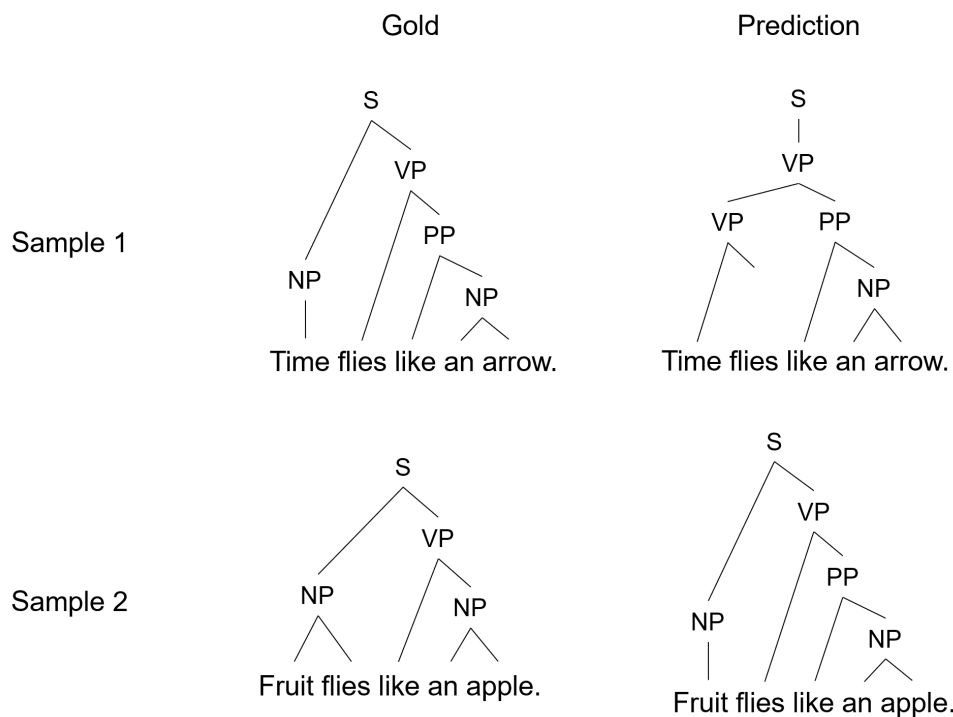
✔

Constituency parsing can be casted to a sequence-labeling task. The main advantage is the faster parsing speed.

问题 2

得 10 分，满分 10 分

Given the following predictions on a set of two sentences:



Which one is larger, the micro average F1 or the macro average F1?

所选答案: ☒ The micro average F1 is larger.

答案: ☒ The micro average F1 is larger.

They are the same.

The macro average F1 is larger.

### 问题 3

得 10 分, 满分 10 分

Assume we have the following context-free grammar G in Chomsky normal form:

S → NP VP

VP → V NP

NP → D N

PP → P NP

VP → VP PP

NP → NP PP

NP → NP CNP

CNP → C NP

NP → "workers" | "sacks"

NP → "garbage" | "junk"

N → "bin" | "sack"

V → "dumped"

P → "of" | "into"

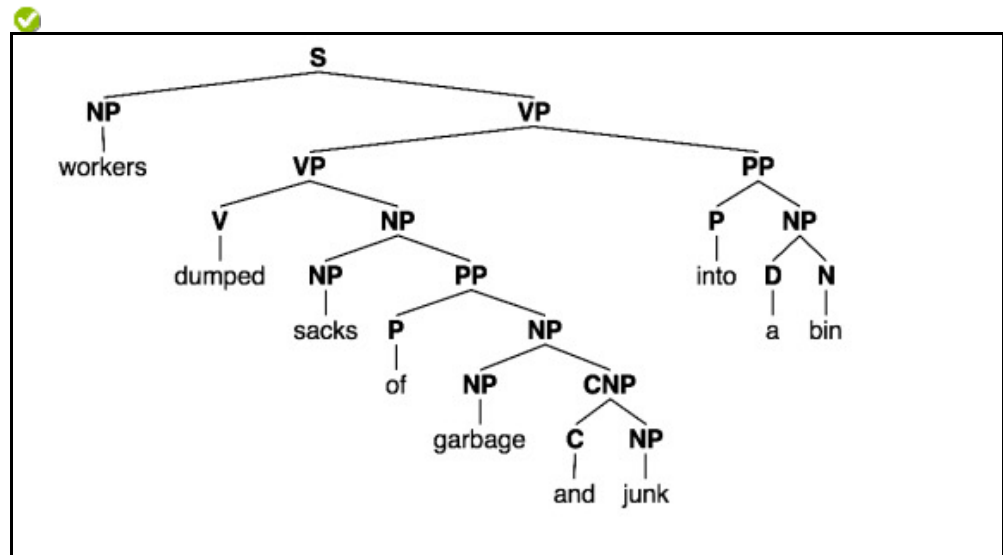
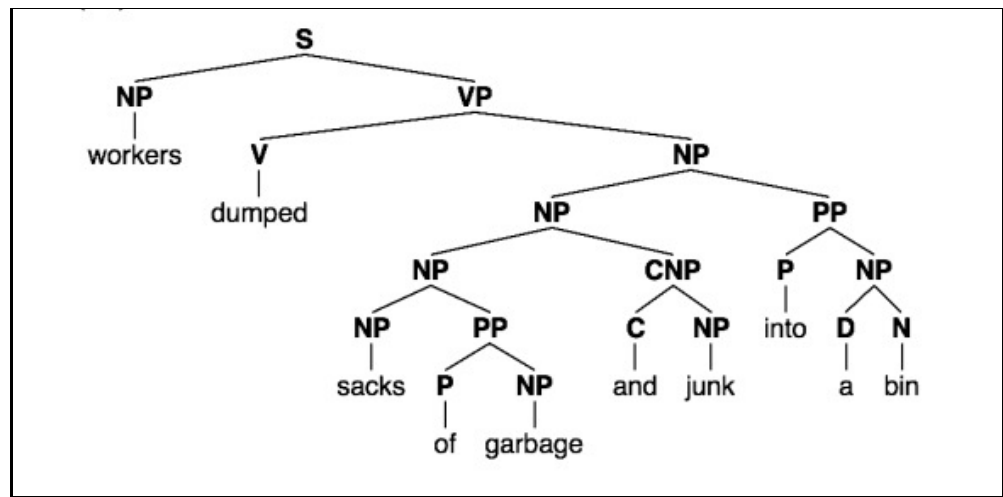
D → "a" | "the"

C → "and"

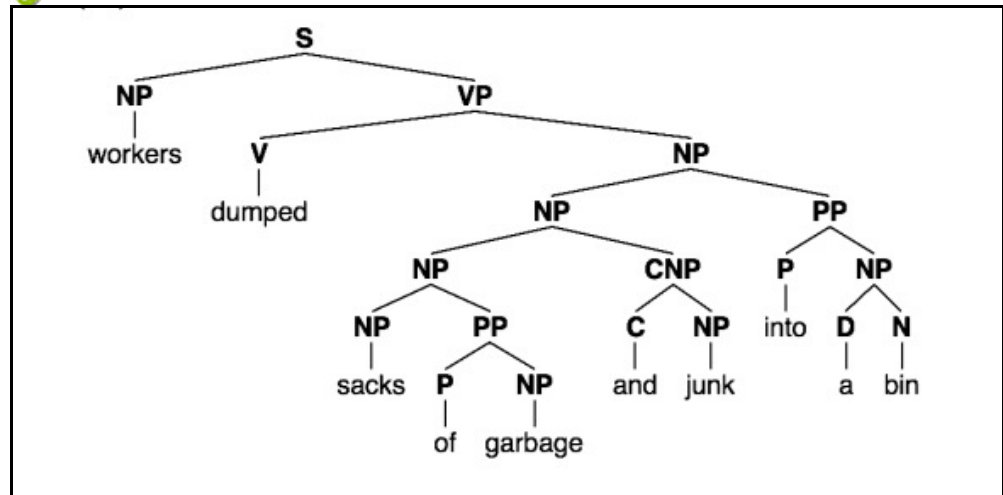
Which of the following trees for the sentence "workers dumped sacks of garbage and junk into a bin" are correct according to G?

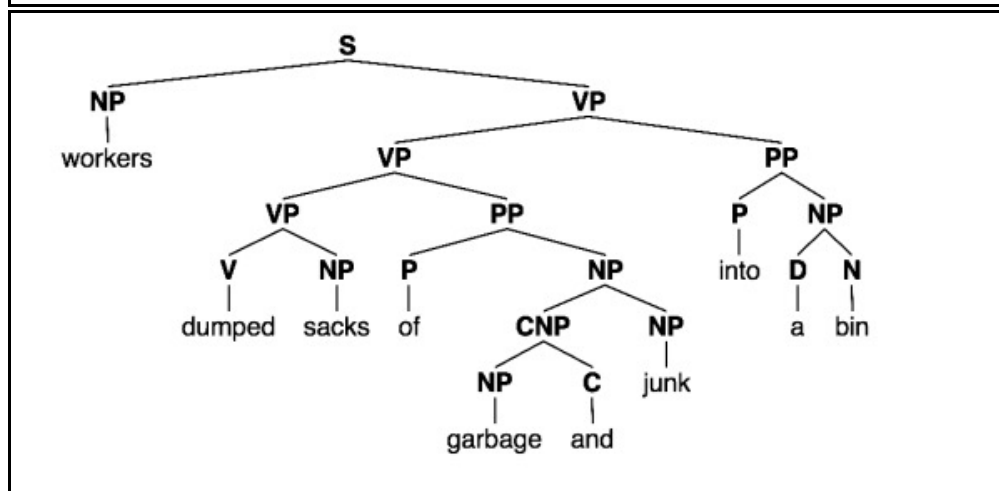
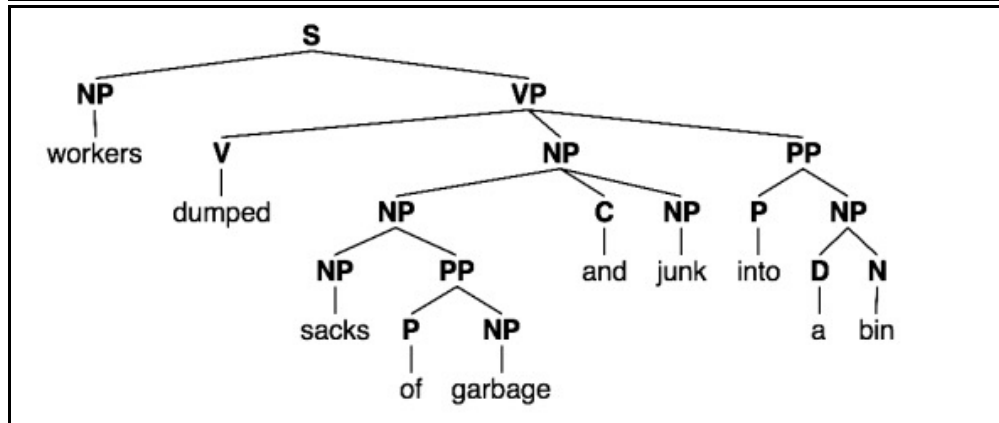
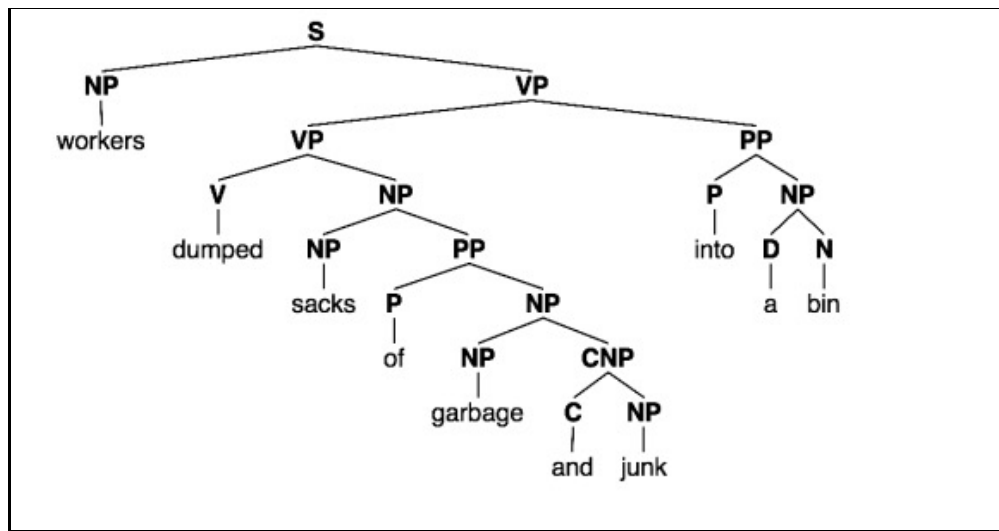
所选答案: ☒

案:



答案:





#### 问题 4

得 10 分, 满分 10 分

Which of the following is/are true about the CKY algorithm?

所选答案: ☒ CKY can be converted to the inside algorithm by replacing **max** with **sum**.

☒ CKY runs in cubic time with respect to the sentence length

☒ It requires the grammar be in Chomsky Normal Form (CNF)

答案: ☒ CKY can be converted to the inside algorithm by replacing **max** with **sum**.

☒ CKY runs in cubic time with respect to the sentence length

CKY is a top-down parsing algorithm

☒ It requires the grammar be in Chomsky Normal Form (CNF)

## 问题 5

得 10 分, 满分 10 分

Consider the language defined by the following grammar.

$S \rightarrow VP\ NP$	$NP \rightarrow kim$
$VP \rightarrow PP\ VP$	$NP \rightarrow oslo$
$NP \rightarrow PP\ NP$	$NP \rightarrow snow$
$VP \rightarrow NP\ V$	$V \rightarrow adores$
$PP \rightarrow NP\ P$	$P \rightarrow in$

Select all sentences that are generated by the grammar.

所选答案: ☒ oslo in snow adores kim

☒ kim adores snow in oslo

答案: ☒ oslo in snow adores kim

snow adores in oslo kim

☒ kim adores snow in oslo

in kim adores oslo snow

## 问题 6

得 10 分, 满分 10 分

Consider the sentence "I like to run" and a PCFG with nonterminals  $\{S, VP, N, P, V\}$ , terminals  $\{I, like, to, run\}$ , start symbol  $S$ , and rules

$S \rightarrow N\ VP\ [0.5]$

$S \rightarrow N\ V\ [0.5]$

$VP \rightarrow V\ VP\ [0.5]$

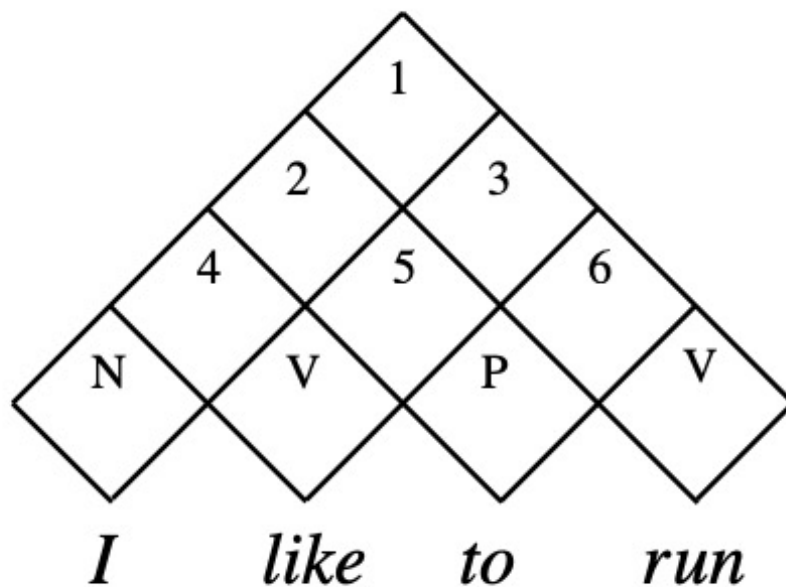
$VP \rightarrow P\ V\ [0.5]$

$V \rightarrow run\ [0.5]$

$V \rightarrow like\ [0.5]$

$N \rightarrow I\ [1.0]$

$P \rightarrow to\ [1.0]$



The figure is a CKY chart, with possible symbols for the leaves already filled in. We want to fill the chart with nonterminals with log probability greater than negative infinity (i.e., nonterminals that are possible to build over these spans of the sentence). Which cells (1-6) in the chart contain possible constructions, i.e., nonterminals that can be built over the given sentence spans with a log probability greater than negative infinity?

所选答案: ☒ B. 1, 3, 4, 6

答案: A. 1, 3, 4, 5, 6

☒ B. 1, 3, 4, 6

C. 1, 3, 6

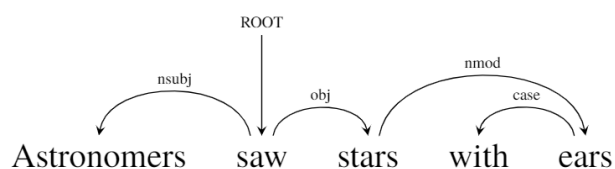
D. 1, 2, 3, 4, 6

## 问题 7

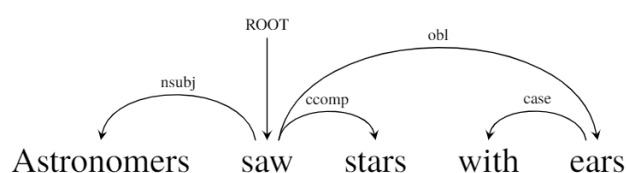
得 10 分, 满分 10 分

Given the following gold and predicted dependency parses:

Gold:



Predicted:



What is the Unlabelled Attachment Score (UAS)? What about the Labelled Attachment Score (LAS)?

所选答案: ☒ UAS = 80%, LAS = 60%

答案: UAS = 80%, LAS = 40%

UAS = 60%, LAS = 80%

☒ UAS = 80%, LAS = 60%

UAS = 60%, LAS = 20%

问题 8

得 10 分, 满分 10 分

Consider the sentence: I love Natural Language Processing.

Head\Dependent	I	love	Natural	Language	Processing
ROOT	15	13	20	10	20
I	-	10	12	1	25
love	10	-	6	19	15
Natural	2	23	-	7	1
Language	13	1	22	-	15
Processing	5	1	7	26	-

Given the arc scores above, what's the dependent of ROOT if we run the Eisner Algorithm?

所选答案: ☒ I

答案: ☒ I

love

Natural

Language

Processing

问题 9

得 10 分, 满分 10 分

In a dependency parse tree, the nodes are the words in a sentence and each word has one and only one dependent.

所选答案: ☒ 错

答案: 对

☒ 错

## 问题 10

得 10 分，满分 10 分

Choose the correct statements

所选



答

案:

Since projective dependency parse trees can be transformed into constituency parse trees, CYK can be used in projective dependency parsing.



Chu-Liu-Edmonds algorithm can be applied to non-projective dependency parsing.

答

案:



Since projective dependency parse trees can be transformed into constituency parse trees, CYK can be used in projective dependency parsing.



Chu-Liu-Edmonds algorithm can be applied to non-projective dependency parsing.

Eisner algorithm can be applied to non-projective dependency parsing.

Since non-projective dependency parse trees can be transformed into constituency parse trees, CYK can be used in non-projective dependency parsing.

## 问题 11

得 10 分，满分 10 分

Consider the sentence: I love Natural Language Processing.

We perform the following transitions in Transition-Based Parsing: SHIFT, SHIFT, LEFT-ARC, SHIFT, SHIFT, SHIFT, LEFT-ARC, LEFT-ARC, RIGHT-ARC, RIGHT-ARC.

What's the dependent of ROOT in the dependency parse tree?

所选答案:



love

答案:

I



love

Natural

Language

Processing

2024年5月29日 星期三 下午07时32分10秒 CST

← 确定