

Week 4 Monday Review Quiz

Q1 Pumping lemma

2 Points

Select all and only the statements that are (informally) equivalent to the pumping lemma.

Every regular language has a pumping length.

Every nonregular language does not have a pumping length.

If L has a pumping length, then L is regular.

If L does not have a pumping length, then L is nonregular.

Save Answer

Q2 Applying pumping lemma

4 Points

In a proof that a language is nonregular using the pumping lemma, which of the following variables represent witnesses whose value we (as the provers) define? (Select all and only that apply)

The positive integer p

The string s

The string x

The string y

The string z

The nonnegative integer i

Save Answer

Q3 Nonregular sets

4 Points

Select and only the languages below that are nonregular.

$\{0^n 1^n \mid n \geq 0\}$

$\{0^n 1^m \mid n, m \geq 0\}$

$\{0^n 1^m \mid 0 \leq n \leq m\}$

$\{0^n 1^m \mid 0 \leq m \leq n\}$

$\{0^n 1^m 0^n \mid n, m \geq 0\}$

Save Answer

Q4 Extended Feedback

0 Points

Any feedback about this week's material or comments you'd like to share? (Optional; not for credit)

Q4.1 What's working?

0 Points

What are you, as a student, doing that is helping your learning?

What are we, as course staff, doing that is helping your learning?

Save Answer

Q4.2 What can be improved?

0 Points

What can you, as a student, change or start doing to improve your learning?

What can we, as course staff, change or start doing to improve your learning?

Additional information you would like to share with the instructor?

Save Answer

Q4.3 Course material

0 Points

Describe the single most confusing concept for you this quarter so far.

Describe the single most interesting concept for you this quarter so far.

Save Answer

Save All Answers

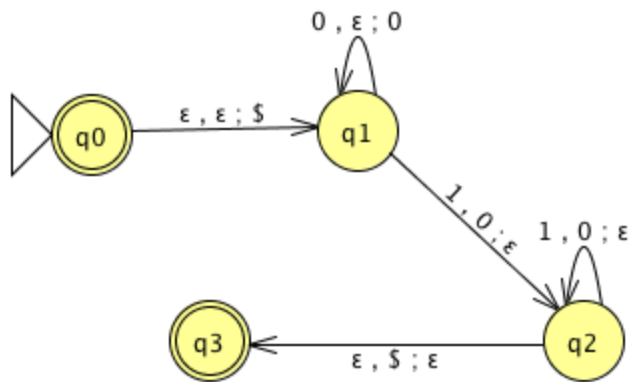
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Week 4 Wednesday Review Quiz

Q1 PDA

4 Points

Consider the PDA with input alphabet $\Sigma = \{0, 1\}$, stack alphabet $\Gamma = \{0, \$\}$ and state diagram:



Q1.1 Accepted?

3 Points

Select all and only the strings below that are accepted by this PDA.

ϵ

\$

0

1

00

01

10

10

000

001

010

010

100

101

110

110

Save Answer

Q1.2 Stack

1 Point

True or false: if the PDA above is in state q_0 then there must be a $\$$ somewhere in its stack.

True

False

True or false: if the PDA above is in state q_1 then there must be a $\$$ somewhere in its stack.

True

False

Save Answer

Q2 Modified PDA

2 Points

Consider the PDA resulting from using the state diagram from Q1 and making q_1 and q_2 also accept states (putting double circles on these nodes).

Select all and only the strings below that are accepted by this new PDA.

ϵ

0

1

00

01

10

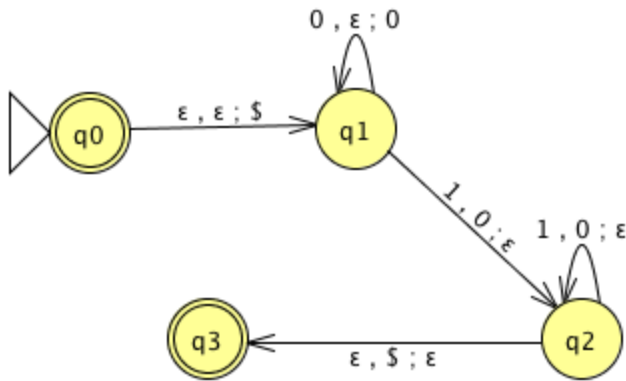
11

Save Answer

Q3 Formal definition of PDA

4 Points

Select the correct outputs for the transition function of the PDA from Q1. The state diagram is included again for reference:



$$\delta((q1, 0, \epsilon)) =$$

- $q1$
- $(q1, 0)$
- $(0, q1)$
- $(q2, 1)$
- $(1, q2)$
- \emptyset
- None of the above.

$$\delta((q2, 1, \epsilon)) =$$

- $\{(q2, 0)\}$
- $\{(q2, \epsilon)\}$
- \emptyset
- None of the above.

Save Answer

Week 4 Friday Review Quiz

Q1 PDA transition labels

10 Points

For this question, assume we have a PDA with input alphabet Σ and stack alphabet Γ .

Q1.1 (a)

2 Points

Select the correct meaning of the transition label

$a, b; c$ when $a \in \Sigma, b \in \Gamma, c \in \Gamma$

- Upon reading a and when a b is at the top of the stack, pop the b and push a c while following this transition
- Upon reading a , if a b is at the top of the stack pop it and push a c while following this transition and if there is not b at the top of the stack, leave the stack unchanged while following this transition.

Save Answer

Q1.2 (b)

2 Points

Select the correct meaning of the transition label

$a, \varepsilon; c$ when $a \in \Sigma$ and $c \in \Gamma$

- Upon reading a and when the stack is empty, push a c while following this transition
- Upon reading a and without looking at the top of the stack, push a c while following this transition

Save Answer

Q1.3 (c)

2 Points

Select the correct meaning of the transition label

$a, b; \varepsilon$ when $a \in \Sigma$ and $b \in \Gamma$

- Upon reading a and when a b is at the top of the stack, clear the stack (make it empty) while following this transition
- Upon reading a and when a b is at the top of the stack, pop the b off the stack and do not push anything onto the stack while following this transition
- Upon reading a and when a b is at the top of the stack, add the character ε to be at the top of the stack while following this transition

Save Answer

Q1.4 (d)

2 Points

Select the correct meaning of the transition label

$a, \varepsilon; \varepsilon$ when $a \in \Sigma$

- Upon reading a and when the stack is empty, do not change the stack while following this transition
- Upon reading a , follow this transition no matter the current status of the stack (and without changing the stack)

Save Answer

Q1.5 (e)

2 Points

Select the correct meaning of the transition label

$\epsilon, \epsilon; \epsilon$

- Follow this transition without consuming any input characters and no matter the current status of the stack (and without changing the stack).
- When the computation has completed reading the input string, follow this transition when the stack is empty.

Save Answer

Q2 Feedback

0 Points

Any feedback about this week's material or comments you'd like to share? (Optional; not for credit)

Save Answer

Save All Answers

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