Week 1 Monday Review Quiz

Q1 Class website
2 Points

Canvas: https://canvas.ucsd.edu/courses/51649

Q1.1 Access?
1 Point

Can you access the Canvas page for this class?

- ◯ Yes
- ◯ No

Save Answer

Q1.2 Menu items

1 Point

When the home page on Canvas is loaded on a large screen, you should see the following menu bar

What do the menu items represent? (Select all and only the correct choices)

- [ ] The calendar icon (2nd from top) links to a weekly view of course material. Clicking on a week expands it to show a description of the week and links to lecture notes, supplemental videos, and more.
- [ ] The sidebar icon (3rd from top) links to a detailed class syllabus. You can find our learning outcomes, class policies and norms, grading information, and FAQ about resources like the book and Flap.js.
- [ ] The textbox icon (middle) links to a listing of the homework assignments and project writeup.
- [ ] The book icon (3rd from bottom) links to a glossary of terms we'll be discussing in class.
- [ ] The play icon (2nd from bottom) links to a page of supplemental videos
- [ ] The question mark (bottom) links to a calendar of drop-in group office hours for Q&A.

Save Answer

Q2 Class logistics

2 Points

We want you to be familiar with class policies and procedures so you are ready to have a successful quarter. Please take a look at the syllabus page on our website and answer the following questions.

Q2.1 (a)

1 Point

What are the graded components for this class? (Select all and only that apply)

- [ ] Attendance
- [ ] Review quiz for each class
- [ ] Homework
- [ ] Project
- [ ] Tests

Save Answer

Q2.2 (b)

1 Point

We'll be using Piazza for class discussions. You can access Piazza through our Canvas homepage.

Which questions should you ask as *private* posts on Piazza (viewable only to the instructors)?

- ○ Followup questions on examples from class
- ○ Questions about a review quiz
- ○ Questions about a homework problem that is "graded for correctness" (rather than for "fair effort completeness")

Save Answer

Q3 #FinAid

1 Point

At the top of the Canvas page is a link to our #FinAid assignment. Completing the #FinAid assignment documents your engagement with the course.

https://canvas.ucsd.edu/courses/51649/quizzes/158899

◯ I have completed and submitted the Canvas assignment.

Save Answer

Q4 Strings and languages

2 Points

Select all and only the correct choices.

- ☐ A **string** over an alphabet Σ is an element of Σ^*
- ☐ A **string** over an alphabet Σ is a subset of Σ^*
- ☐ A **language** over an alphabet Σ is an element of Σ^*
- ☐ A **language** over an alphabet Σ is a subset of Σ^*

Save Answer

Q5 Examples of strings and languages

3 Points

Select all and only the correct choices.

- [ ] The empty string ε is a string over any alphabet Σ
- [ ] The empty string ε is a language over any alphabet Σ
- [ ] The empty set $\emptyset$ is a string over any alphabet Σ
- [ ] The empty set $\emptyset$ is a language over any alphabet Σ
- [ ] The set of all strings over Σ (written Σ^*) is a string over Σ
- [ ] The set of all strings over Σ (written Σ^*) is a language over Σ

Save Answer

Q6 Optional

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

Submit & View Submission ›

Week 1 Wednesday Review Quiz

Student Name

Search students by name or email...

Q1 Strings in language described by set notation

1 Point

Consider the language
$\{w \mid w \text{ is a string over } \{0,1\} \text{ and } |w| \text{ is an integer multiple of } 3\}$.
Which of the following are elements of this language? (Select all and only that apply)

- [ ] The empty set
- [ ] The empty string
- [ ] 0
- [ ] $(1, 0, 1)$
- [ ] $\{000\}$

Save Answer

Q2 Describing a language with a regular expression
1 Point

Which of the following regular expressions describe the language $\{w \mid w \text{ is a string over } \{0,1\} \text{ and } |w| \text{ is an integer multiple of } 3\}$?
(Select all that apply)

- [ ] $(0 \cup 1)^*$
- [ ] $((0 \cup 1)(0 \cup 1)(0 \cup 1))^*$
- [ ] $((000) \cup (001) \cup (010) \cup (011) \cup (100) \cup (101) \cup (110) \cup (111))^*$
- [ ] $(000)^* \cup (001)^* \cup (010)^* \cup (011)^* \cup (100)^* \cup (101)^* \cup (110)^* \cup (111)^*$

Save Answer

Q3 Describing a language in mathematical notation
1 Point

The language over $\{0, 1\}$ described by the regular expression 1^+ is $L(\ (1)^+\ ) =$

(Select all that apply)

- [ ] The set of all strings that end in 1
- [ ] $\{w1 \mid w \in \{0, 1\}^*\}$
- [ ] The set of all nonempty strings of 1
- [ ] $\{1^n \mid n \in \mathcal{N}\}$

Save Answer

Q4 Describing a language in mathematical notation
1 Point

The language over $\Sigma_1 = \{0, 1\}$ described by the regular expression $\Sigma_1^* 1$ is $L(\ \Sigma_1^* 1\ ) =$

(Select all that apply)

- [ ] The set of all strings that end in 1
- [ ] $\{w1 \mid w \in \{0,1\}^*\}$
- [ ] The set of all nonempty strings of 1
- [ ] $\{1^n \mid n \in \mathcal{N}\}$

Save Answer

Q5 Strings in language described by set notation
1 Point

Consider the language $X = \{w \mid w \text{ is a string over } \Sigma \text{ and has at least two } a\text{'s and exactly one } b\}$ over the alphabet $\Sigma = \{a, b\}$. Which strings of length 3 are elements of this language? (Select all and only that apply)

- [ ] aaa
- [ ] aab
- [ ] aba
- [ ] abb
- [ ] baa
- [ ] bab
- [ ] bba
- [ ] bbb

Save Answer

Q6 Strings in language described by regular expression
1 Point

Which strings over the alphabet $\{a, b\}$ are in the language described by the regular expression $(a \cup b)^*$? (Select all and only that apply)

- [ ] bbbb
- [ ] bab
- [ ] (a,b)
- [ ] The empty set
- [ ] The empty string
- [ ] {aba}
- [ ] a

Save Answer

Q7 Strings in language described by regular expression
1 Point

Select all and only the strings over $\{a, b\}$ that are in $L(aa^* \cup bb^*)$

- [ ] ε
- [ ] aa
- [ ] ba

Save Answer

Q8 Describing a language with a regular expression
1 Point

Which of the following regular expressions describe the language $\{00, 01, 10, 11\}$? (Select all that apply)

- [ ] $\{00, 01, 10, 11\}$
- [ ] $00 \cup 01 \cup 10 \cup 11$
- [ ] $(0 \cup 1)(0 \cup 1)$
- [ ] $(00 \cup \emptyset) \cup (01 \cup 10 \cup 11)$
- [ ] $(0 \cup 1)^*$

Save Answer

Q9 Describing a language with a regular expression
2 Points

Which of the following regular expressions describe the language $\{0^n 1 \mid n \text{ is even}\}$? (Select all that apply)

- [ ] $(0^{2i}1)^*$
- [ ] $(\varepsilon \cup 00)^*1$
- [ ] $(\varepsilon \cup (00)^+)1$
- [ ] $(00)^*1$

Save Answer

Q10 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

Submit & View Submission ›

Week 1 Friday Review Quiz

Student Name

Search students by name or email...

Q1 Combining languages

5 Points

For this question, consider an arbitrary alphabet Σ and, whenever L_1, L_2 are sets of strings over Σ, we can use the following rules to define associated sets of strings:

$$\text{SUBSTRING}(L_1) := \{w \in \Sigma^* \mid \text{there exist } a, b \in \Sigma^* \text{ such that } awb \in L_1\}$$

and

$$L_1 \circ L_2 := \{w \in \Sigma^* \mid w = uv \text{ for some strings } u \in L_1 \text{ and } v \in L_2\}$$

For the statements below, let $\Sigma = \{0, 1\}$ be the alphabet.

Select all and only the true statements.

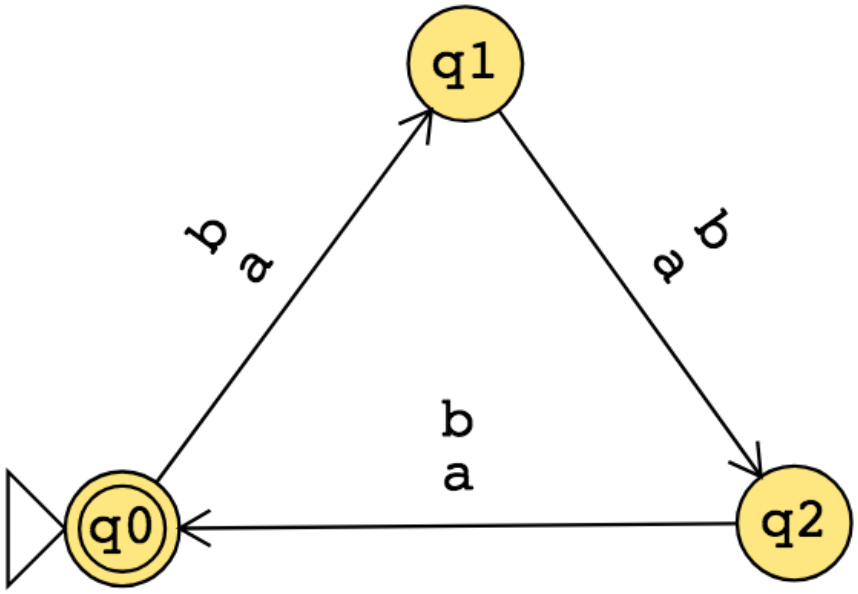
- [ ] $SUBSTRING(\{0\}) = SUBSTRING(\{1\}) = \{\varepsilon\}$
- [ ] $SUBSTRING(\emptyset) = \emptyset$
- [ ] $SUBSTRING(\Sigma^*) = \Sigma^*$
- [ ] $\{0\} \circ \{1\} = \{0, 1\}$
- [ ] $\{0, 1, 01\} \circ \{\varepsilon\} = \{01\}$

Save Answer

Q2 Strings in a language recognized by a DFA

1 Point

Select all (and only) the strings below that are accepted by the DFA.



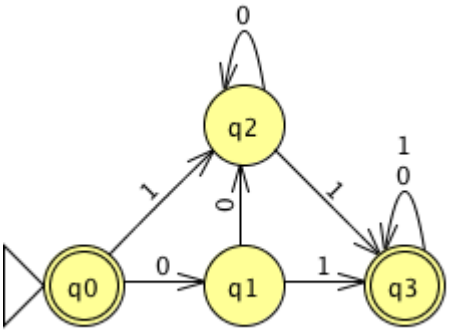
- [ ] The empty string
- [ ] a
- [ ] b
- [ ] abab
- [ ] ab
- [ ] bbb
- [ ] bba

Save Answer

Q3 Describing DFA

4 Points

Consider the DFA, M, given by the state diagram:



Q3.1 (a)

1 Point

The author of this DFA claims that its formal definition is:
M = ({q0, q1, q2, q3}, {0, 1, 2, 3}, δ, q0, q3) with δ given by the table below:

	0	1
$q0$	$q1$	$q2$
$q1$	$q2$	$q3$
$q2$	$q2$	$q3$
$q3$	$q3$	$q3$

Select all and only the components of the formal definition that are correct.

- [ ] Set of states
- [ ] Input alphabet
- [ ] Transition function
- [ ] Start state
- [ ] Set of accept states

Save Answer

Q3.2 (b)
1 Point

True or False: The empty string is accepted by this DFA.

- ◯ True
- ◯ False

Save Answer

Q3.3 (c)
1 Point

True or False: $L(M)$ is infinite.

- ◯ True
- ◯ False

Save Answer

Q3.4 (d)
1 Point

True or False: If $x \in L(M)$, the string obtained by flipping each bit in x (changing 0 to 1 and 1 to 0) is also in L(M).

- ◯ True
- ◯ False

Save Answer

Q4 Feedback
0 Points

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

Save Answer