Quiz: Wed, 22 Aug 2018

1. Who is the author of the *primary* textbook for the class?
   (a) Sibelius; (b) Sebesta; (c) Sethi; (d) Stansifer; (e) Scott

2. How many students received an ‘F’ from the instructor recently for reasons of academic misconduct?
   (a) 2; (b) 20; (c) 200; (d) 2,000

3. true / false There will be a short quiz at the beginning of (almost) every class meeting.

4. In a class of 50 computer science seniors, one should expect how many to fail to put their name on the quiz card?
   (a) 0; (b) 5; (c) 10; (d) 50
1. *Abstraction* means
   (a) signification of words or forms; (b) the medium of expression;
   (c) human-oriented presentation of data; (d) free from convoluted
   interactions; (e) act of determining essential properties.

2. Arabic is to linguistics as:
   (a) expression::visualization; (b) complexity::abstraction;
   (c) Python::programming languages; (d) gender::sex.

3. Software engineers need math because:
   (a) computer operations come from mathematics;
   (b) visualization of data is mathematical; (c) calculus is essential
   to calculating; (a) software consists of abstract constructs.

4. true / false Complexity can be harmful.

5. In the field of programming languages one studies: (a) the
   writings of Guido van Rossum; (b) expressing computation;
   (c) visualization data; (d) the LAMP stack.
1. Which one of the following is not a computational paradigm: (a) logic programming; (b) imperative; (c) categorical; (d) functional.

2. true / false Recursion is a distinguishing characteristic of the computational paradigms.

3. true / false Objects are a distinguishing characteristic of the computational paradigms.

4. true / false Evidence of the Sapir-Whorf hypothesis is the fact that the people cling to their first programming language.

5. The sky does not have a color because: (a) it contradicts physics; (b) the ancient Greeks drank too much (purple) wine; (c) ancient people couldn’t see the sky because of thick (green) foliage; (d) one cannot paint it
1. Alfred Tarski (1902–1983) is known for: (a) theory of computation; (b) semantics; (c) finding’s Frege’s flaw; (d) theory of quantification

2. Using predicate logic, formulate the sentence: every student has some professor they admire. Use the predicates $S(x)$ for student, $P(x)$ for professor, and $A(x, y)$ for $x$ admires $y$.

3. true / false  Programming on a Turing machine is very rudimentary.

4. Which one of the following does not predate FORTRAN (a) Plankalkül; (b) IBM 704; (c) APL; (d) Short code

5. Which one of the following is not a programming language: (a) Go; (b) Rust; (c) Ruby; (d) Diamond; (e) Lua
1. true / false Declarative programming emphasizes the “how” over the “why.”

2. true / false HTML is not a general purpose programming language.

3. true / false Russell’s paradox is a linguistic and not a mathematical paradox.

4. XXXIII divided by IV is:
   (a) V; (b) VI; (c) VII; (d) VIII; (e) IX.

5. The name of the Greek letter π rhymes with all of the following Greeks letters except for:
   (a) ν; (b) ξ; (c) φ; (d) χ; (e) ψ.

Use the back of old quiz cards!
Quiz: Fri, 31 Aug 2018

1. true / false FORTRAN can reasonably be considered the first programming language.

2. true / false The syntax known as “Cambridge prefix” is used for all data and all code in LISP.

3. true / false ISO stands for the organization officially known as the International Standards Organization.

4. Surprisingly the programming language is used today in financial applications. It was originally designed in the 1960’s to describe hardware and relies heavily on arrays and vectors. It has a modern successor called .

5. Grace Hopper led the development of , a programming language for business applications.
Quiz: Wed, 5 Sep 2018

1. Ada
2. APL
3. COBOL
4. C++
5. C
6. FORTRAN
7. Java
8. LISP
9. Pearl
10. Python

A. IBM, J. Backus
B. Augusta Ada Bryon
C. Dahl and Nygaard
D. Ralph Griswold
E. Kenneth Iverson
F. Guido van Rossum
G. John McCarthy
H. Kernighan and Richie
I. Bjarne Stroustrup
J. Sun, J. Gosling
K. US DoD, G. Hopper
L. US DoD, J. Icbaih
M. Larry Wall
Quiz: Wed, 7 Sept 2018

1. A *lexeme* is a
   (a) letter; (b) token; (c) word; (d) phrase

2. In formal languages, a *symbol* is
   (a) a letter used to designate something  (b) hallmark or emblem
   (c) a sign to represent something such as an organization  (d) one
   indivisible element of a notational system

3. The perspective the programming language field has on syntax
   can best be described as:
   (a) annoyance; (b) basic implementation; (c) construction;
   (d) description

4. true / false  Formal language theory applies to the lexical
   structure of programming languages, but not to the
   phrase structure.

5. true / false  A formal language is a set of symbols from an
   alphabet.

6. true / false  Language can be studied in three parts: pragmatics,
   syntax, and semiotics.
Quiz: Mon, 10 Sept 2018

What formal languages over the alphabet \{a, b, c, d\} do the following regular expression represent? Choose from the formal languages below. (You may choose a letter any number of times.)

1. \(\emptyset^*\)
2. \((a + b)^*\)
3. \((a^*)^*\)
4. \((a + \emptyset)^*\)
5. \(((a \cdot b) + (c \cdot d))\)
6. \(((a \cdot b) + (c \cdot d))^* \cdot c\)
7. \(((a + b) + a^*) \cdot c\)
8. \((a^* + b)^*\)
9. \(((a + b)^* + (a + c)^*)\)

A. \(\{\}\)
B. \(\{\epsilon\}\)
C. \(\{abcd\}\)
D. \(\{ab, cd\}\)
E. \(\{a, b, aa, ab, ba, bb, \ldots\}\)
F. \(\{\epsilon, a, b, aa, ab, ba, bb, \ldots\}\)
G. \(\{ac, bc, aac, abc, bac, bbc, \ldots\}\)
H. \(\{c, abc, cdc, abcdc, cdcdc, cdabc, ababc, \ldots\}\)
I. none of the above
Quiz: Wed, 12 Sept 2018

1. true / false Syntax diagrams are equivalent to context-free grammars.

2. true / false Back references can be defined in terms of the primitive regular expressions and, so, are just “macros” or “syntactic sugar.”

3. true / false Regular expressions are great because they are more expressive than other common formalisms.

4. true / false There are tools in wide-spread use to generate scanners automatically from regular expressions.

5. true / false Scanner generators and parser generators are examples of a kind of programs which enable programmers to describe what they want and not how to implement it.

6. If \( \d \) is the regular expression for a digit ([0–9]), then the regular expression \( \d+ \ \d+? \) matches what part of 321 3451324?
   (a) 3 3; (b) 3 3451324; (c) 321 3; (d) 321 3451324.
1. Show that the following grammar with non-terminals $S, A, \text{ and } I$ is ambiguous:

\[
\begin{align*}
S & \rightarrow A \\
A & \rightarrow A \times A \mid I \\
I & \rightarrow a \mid b \mid c
\end{align*}
\]
1. Show that the following grammar with non-terminals $S$, $A$, and $I$ is ambiguous:

$$
S \rightarrow A \\
A \rightarrow A \times A \mid I \\
I \rightarrow a \mid b \mid c
$$
1. true / false  The propositional formula $A \& B \rightarrow C$ is necessarily true if $B$ is false.

2. true / false  Assertions in programs help debugging.
### Quiz: Mon, 17 Sep 2018

*Test on Monday, 24 Sept 2018!*

**Syntax and Semantics**

1. **true / false** The Cherokee script is used in writing FORTRAN programs.
2. **true / false** Assertions in programs help debugging.
3. **true / false** A formula of first-order logic can be used to characterize a set of computer states.
4. **true / false** “Sue me if my postcondition is false, sue you if my precondition is false.”
5. Complete the last two columns of the following truth table.

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
<td>A&amp;B</td>
<td>A&amp;B ⇒ C</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>-----</td>
<td>--------</td>
</tr>
<tr>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>F</td>
<td>T</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>T</td>
<td>F</td>
<td>F</td>
<td></td>
</tr>
</tbody>
</table>
Quiz: Wed, 19 Sep 2018

Test on Monday, 24 Sept 2018!
Syntax and Semantics

Fill in the box with the phrase that best describes the approach of each of the following types of semantics:

1. denotational
2. operational
3. natural
4. structural
5. axiomatic

is defined in terms of . . .

A rules for evaluation
B Post systems
C rules relating states
D attribute grammars
E mathematical objects
F “small-step” transitions
G an abstract machine
H a 1985 song by Paul Hardcastle “19”