AP Computer Science A/B
[Ver. 2.0]

Unit 0: Orientation

WEEK 0: ORIENTATION

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eC Learning Channel

IEEE

USC

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Overview

LECTURE 1

AP Computer Science Course A

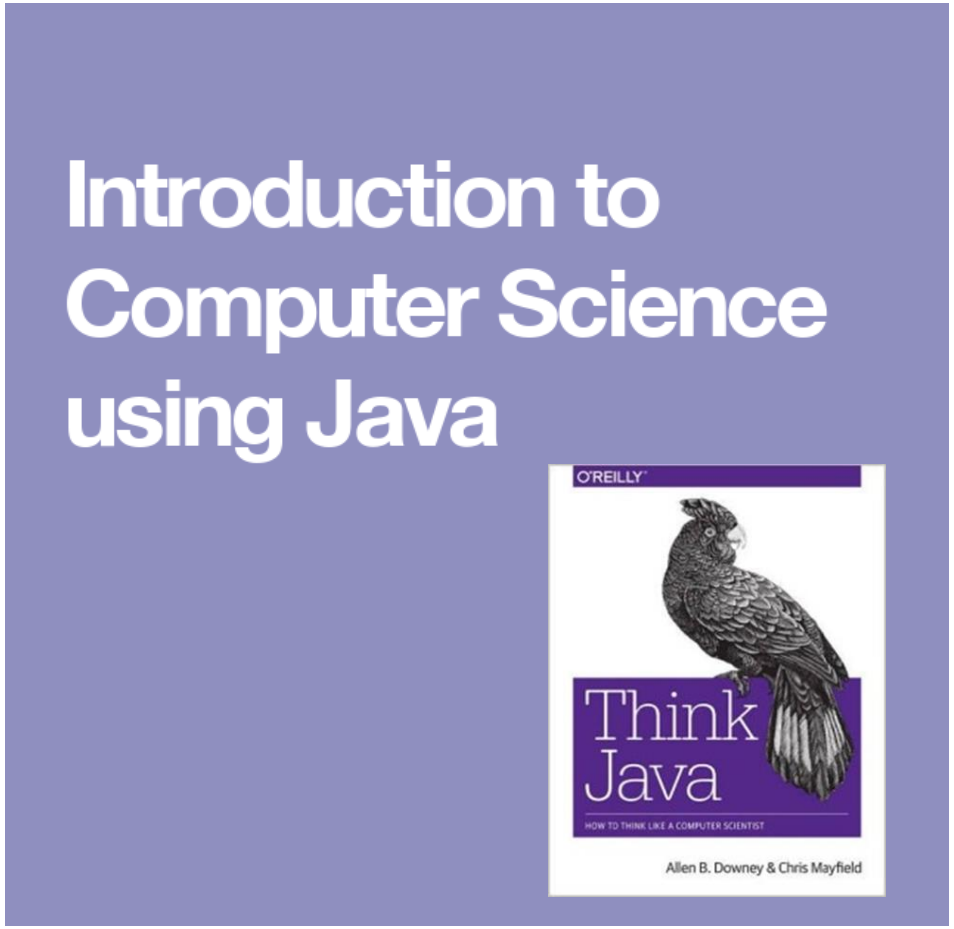
The CED organizes the course into ten commonly taught units [Starting 2019-2020 School Year]

- This series of units represents a sequence that is found in widely adopted college textbooks and that many AP Computer Science A teachers have told us they follow:

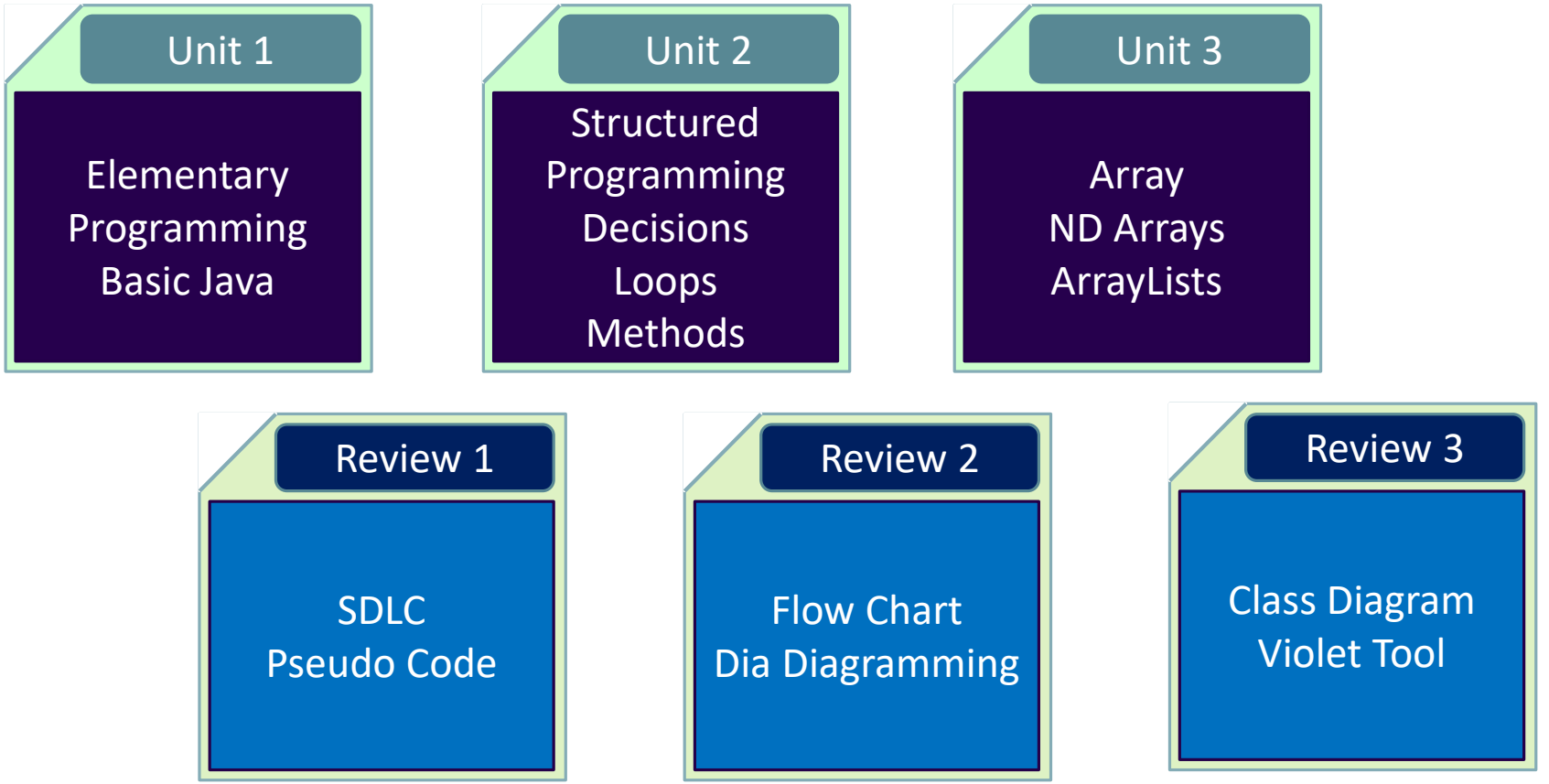
1. Primitive Types
2. Using Objects
3. Boolean Expressions and if Statements
4. Iteration
5. Writing Classes
6. Array
7. ArrayList
8. 2-D Array
9. Inheritance
10. Recursion

Introduction to Programming Using Java

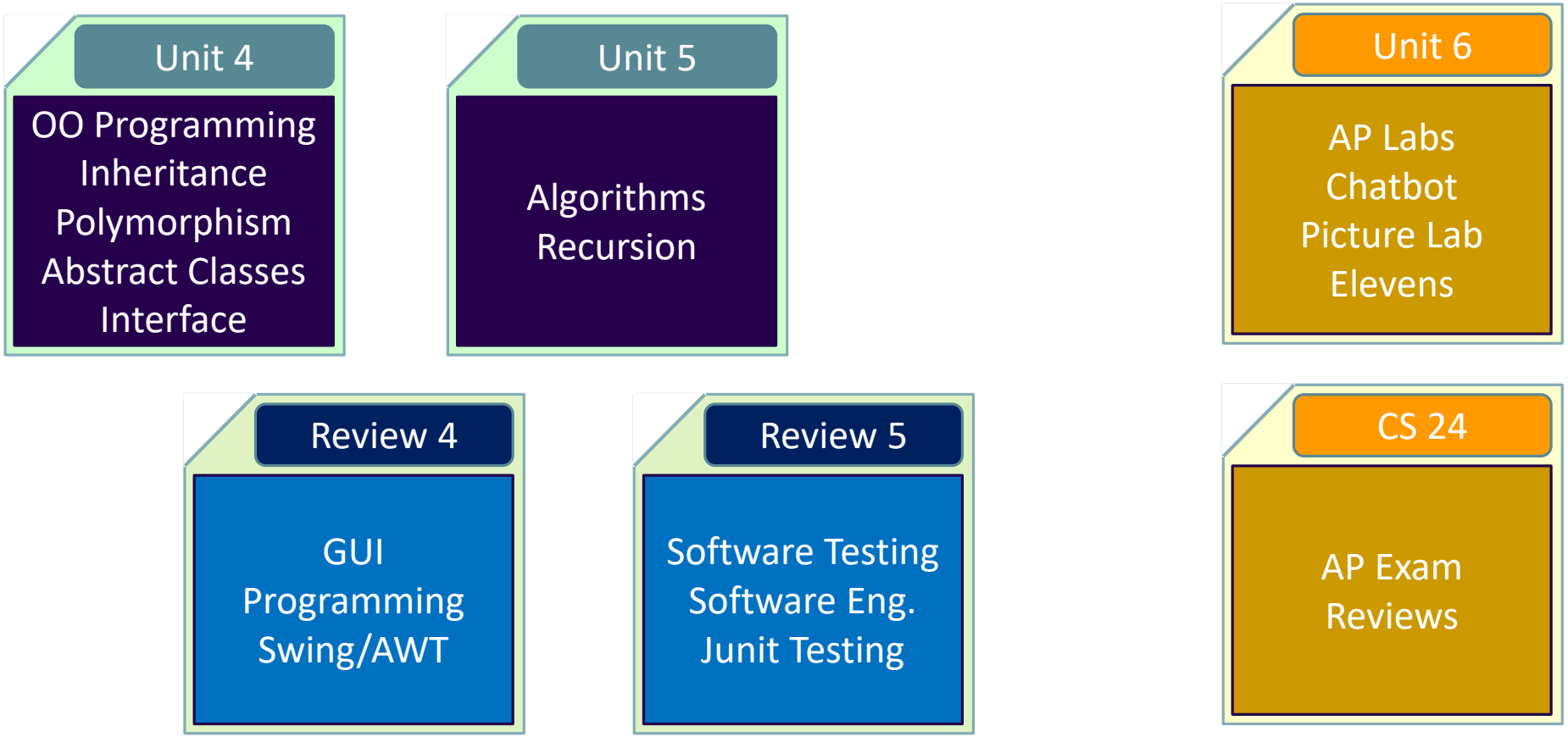
CS 21 Think Java (Pre-AP Java)



Java Programming Essentials
CS 22 AP Computer Science A



Java Object-Oriented Programming
CS 23 AP Computer Science B



Tools

LECTURE 2

eC Academy

Realize Your Dreams

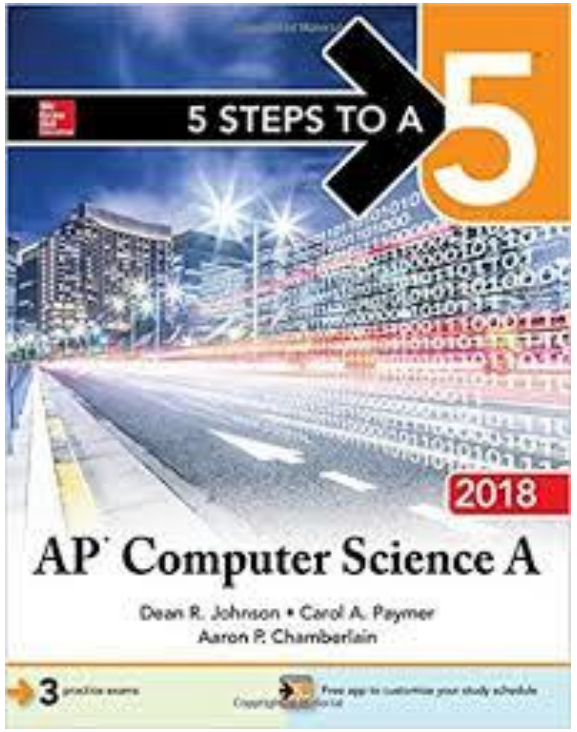
PeaZip

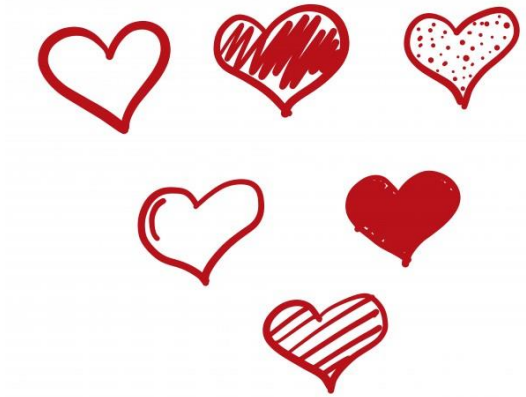
Textbook

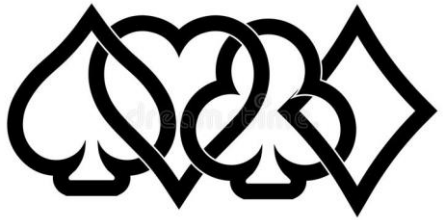
LECTURE 3

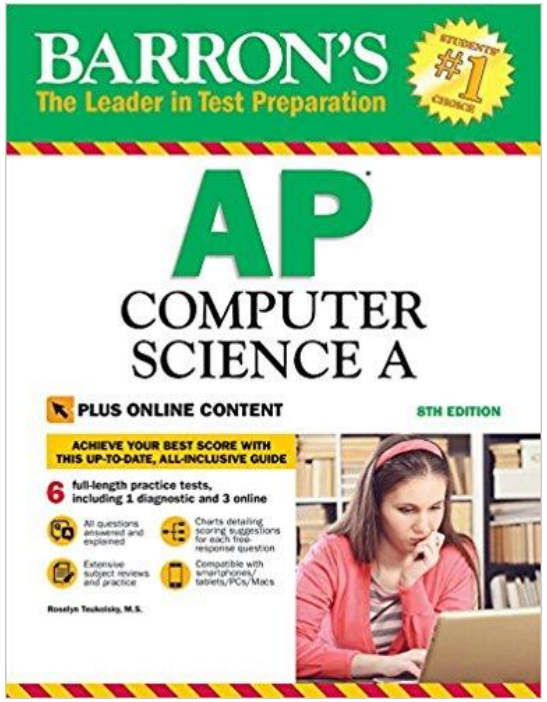
Java Programming Essentials: ...

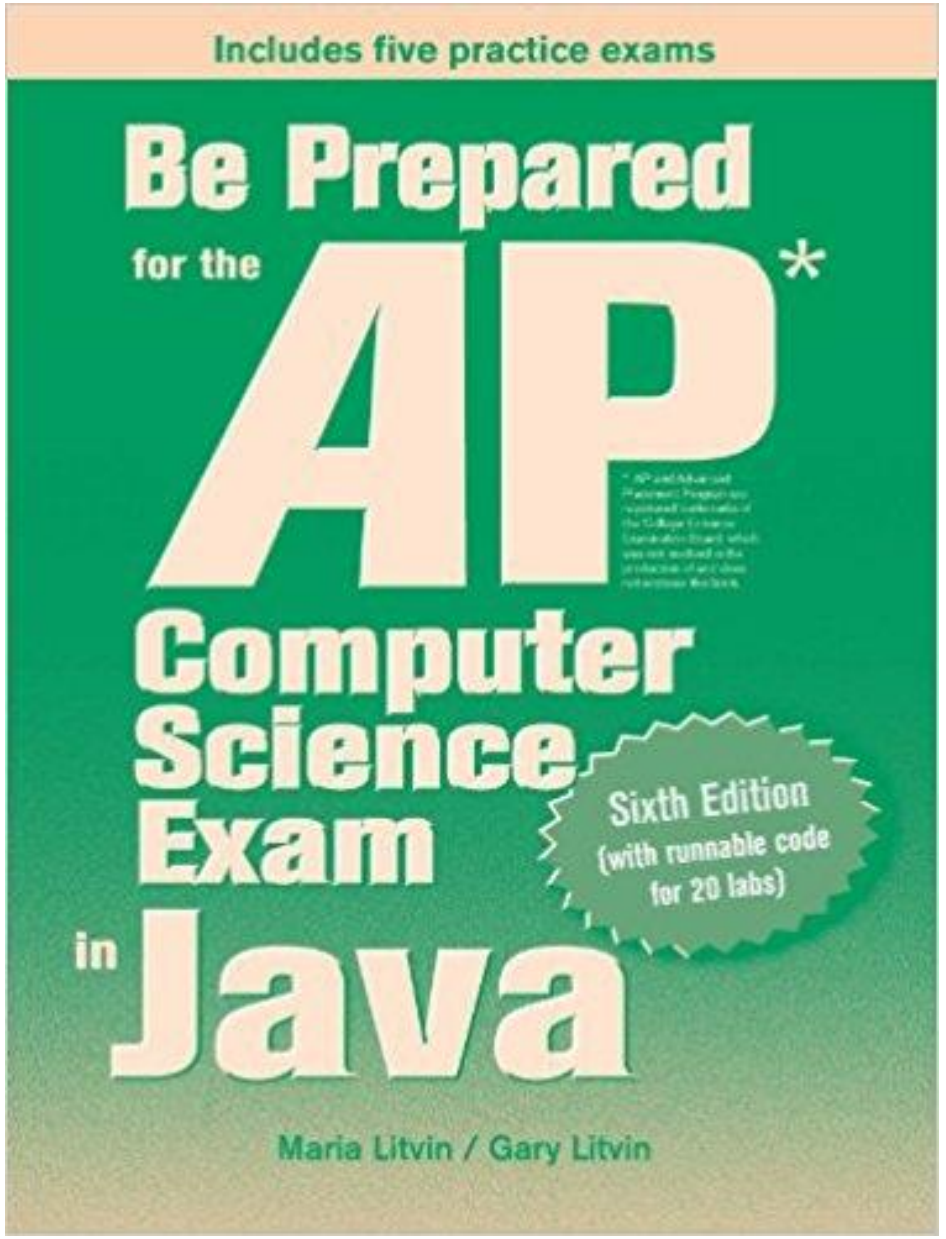
ıter Science Review


5 STEPS TO A 5
2018
AP Computer Science A
Dean R. Johnson • Carol A. Paymer
Aaron P. Chamberlain
3






BARRON'S
The Leader in Test Preparation
#1
AP
COMPUTER SCIENCE A
PLUS ONLINE CONTENT
8TH EDITION
ACHIEVE YOUR BEST SCORE WITH THIS UP-TO-DATE, ALL-INCLUSIVE GUIDE
6 full-length practice tests, including 1 diagnostic and 3 online
Roselyn Teukolsky, M.S.


Includes five practice exams
Be Prepared
for the
AP*
Computer Science Exam
in
Java
Sixth Edition
(with runnable code for 20 labs)
Maria Litvin / Gary Litvin

APCSA Exam

LECTURE 4

AP Java Subset:

https://apstudent.collegeboard.org/apcourse/ap-computer-science-a/about-the-exam/java-subset

- The AP Java subset is intended to outline the features of Java that may appear on the AP Computer Science A Exam.
- The AP Java subset is NOT intended as an overall prescription for computer science courses – the subset itself will need to be supplemented in order to address all topics in a typical introductory curriculum.
- For example, input and output must be part of a course on computer programming. However, there are many ways to handle input and output in Java.
- Because of this variation, details of input and output(except for basic text output using **System.out.print** and System.out.println) are not tested on the AP Computer Science A Exam.

AP Computer Science Format

- The exam is three hours long and has two parts — multiple choice and free response. Each section is worth 50% of the final exam grade.
- You will not be tested on minor points of Java syntax.
- All responses involving code must be answered in Java. If your free response answer involves too much materials not in AP Java. That means you are going into a wrong direction.

AP Computer Science Exam Format and Score Allocation (New since 2016)

- **Section I: Multiple Choice** — 40 Questions;

  1 hour and 30 minutes
- **Section II: Free Response** — 4 questions;

  1 hour and 30 minutes

  Each 9 points

  (Total score curved to 40)

Total 80 points. Best score 80/80.

Multiple Choice Problem
1 point/question no deduction.

1. Consider the following code segment.

```
int value = 15;
while (value < 28)
{
  System.out.println(value);
  value++;
}
```

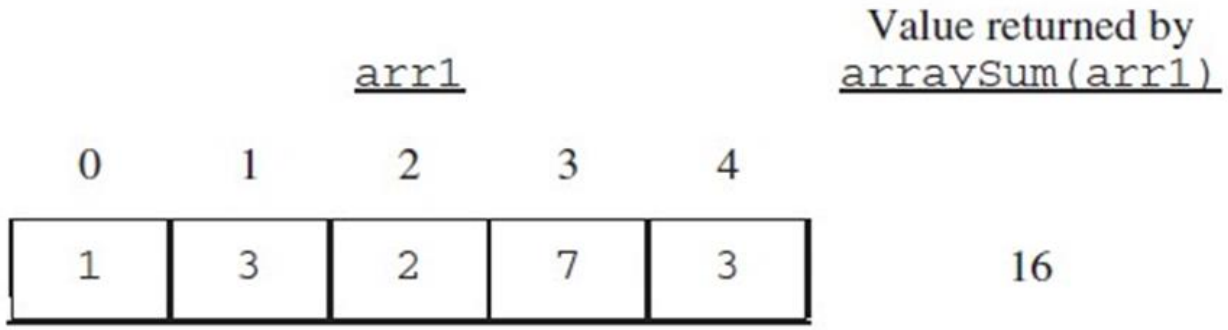
What are the first and last numbers output by the code segment?

	First	Last
(A)	15	27
(B)	15	28
(C)	16	27
(D)	16	28
(E)	16	29

Free Response Problem
No Computer, No Graphics, Handwriting !!!

1. This question involves reasoning about one-dimensional and two-dimensional arrays of integers. You will write three static methods, all of which are in a single enclosing class, named `DiverseArray` (not shown). The first method returns the sum of the values of a one-dimensional array; the second method returns an array that represents the sums of the rows of a two-dimensional array; and the third method analyzes row sums.

   (a) Write a `static` method `arraySum` that calculates and returns the sum of the entries in a specified one-dimensional array. The following example shows an array `arr1` and the value returned by a call to `arraySum`.



Exam Updates

Starting in the 2019-20 school year, there will be updates to the AP Computer Science A Exam to ensure consistency in the distribution of skills assessed on every version of the exam:

- The weighting, timing, point values, and number of questions on the exam aren't changing.
- The exam will have question types that stay consistent every year so that you and your students know what to expect on exam day.
- The four free-response question types will remain the same from year to year:
  - Question 1: Methods and Control Structures, where students call methods and work with control structures without the added complexity of data structures.
  - Question 2: Class, where students design and implement a described class.
  - Question 3: Array/**ArrayList**, where students complete program code that uses array or **ArrayList** objects.
  - Question 4: 2-D Array, where students complete program code that uses 2-D arrays.

Exam Updates

Starting in the 2019-20 school year, there will be updates to the AP Computer Science A Exam to ensure consistency in the distribution of skills assessed on every version of the exam:

- Free-response questions will measure student performance at a range of performance levels. (Currently, each free-response question is written to assess students at the highest ability levels.)
- There will be defined skills assessed in the same proportions on all versions of the exam. (Currently, because there aren't any defined course skills, the assessed skills vary.)

Schedule

LECTURE 5

CS 22 AP Computer Science A

Week	Topic	Time
1	Unit 1/Chapter 1: Introduction	
2	Unit 1/Chapter 2: Elementary Programming – Data Types and Number System	
3	Unit 1/Chapter 2: Elementary Programming – Operators and Type Conversion	
4	Unit 1/Chapter 3: Boolean, Character and APIs – Boolean, Character, Math classes	
5	Unit 1 Chapter 3: Boolean, Character and APIs – String class and Unit 2/Chapter 4/5: Basic if-else and loops	
6	Unit 2/Chapter 4: Decisions – Switch/Conditional Statements and Boolean Algebra	
7	Unit 2/Chapter 5: Loops – Repetition, Indexed, Sentinel, Input Validation, 2D space, Histogram (Standard Loops)	
8	Unit 2/Chapter 5: Loops – Swap, rotation, shuffling, factorial, reverse, palindrome, toBinary, Sum, Max (Special)	
9	Unit 2/Chapter 6: Methods – Basic Recursion	
10	Unit 3/Chapter 7: 1-D Arrays	
11	Unit 3/Chapter 7: 1-D Arrays – Sequence and Array Processing	
12	Unit 3/Chapter 8: N-D Arrays – 2D Arrays	
13	Unit 3/Chapter 9: ArrayList	
14	Unit 3/Chapter 9: ArrayList – ArrayList Processing – Insertion/Deletion/Frequency List/Non-occurring List	

CS 23 AP Computer Science B

Week	Topic	Time
1	Unit 4/Chapter 9: Classes and Objects I (Program Structure, Data Structure)	
2	Unit 4/Chapter 9: Classes and Objects II (Array of Objects, Objects of Arrays)	
3	Unit 4/Chapter 9: Classes and Objects III (Scope, Encapsulation, and other topics)	
4	Unit 4/Chapter 10: Object-Oriented Thinking – IsA, HasA, Class Design Topics	
5	Unit 4/Chapter 10: Object-Oriented Thinking –String Builder, String Buffer, BigInteger, BigDecimal	
6	Unit 4/Chapter 11: Inheritance	
7	Unit 4/Chapter 11: Polymorphism	
8	Unit 4/Chapter 12: Abstract Class and Interface	
9	Unit 4/Chapter 13: Exceptions and File I/O	
10	Unit 5/Chapter 14: Algorithm Study	
11	Unit 5/Chapter 15: Algorithm – Lin/Bin Search, Swap, Rotation, …	
12	Unit 5/Chapter 15: Algorithm Sorting – Insertion Sort, Selection Sort, Bubble Sort, Merge Sort	-
13	Unit 5/Chapter 16: Recursion – Study of Recursion and isPalindrome, toBinary algorithms	
14	Unit 5/Chapter 16: Recursion – Tail Recursion, Helper Function, Accumulator, Recursive Processing.	

CS 24 AP Computer Science A Review

Week	Topic	Time
1	Week 0: MC 2009	
2	Week 1: McGraw Hills Practice Diagnostic Exam	
3	Week 2: AP FRQ2009	
4	Week 3: Barron 1 - Basic Programming, McGraw Hills Practice Exam 1, AP2010FRQ	
5	Week 4: Barron 2 - Java API Classes, McGraw Hills Practice Exam 2, AP2011FRQ	
6	Week 5: Barron 3 - Data Structure, Barrons Practice Exam 1, AP2012FRQ	
7	Week 6: Barron 4 - Control Structure, Barrons Practice Exam 2, AP2013FRQ	
8	Week 7: Barron 5 - OOP Barrons Practice Exam 3, AP2014FRQ	
9	Week 8: Barron 6 - Algorithm 1 Be Prepared 1, AP2015FRQ	
10	Week 9: Barron 7 - Algorithm 2 Be Prepared 2, AP2016FRQ	
11	Week 10: Barron 8 - Design Pattern 1 Be Prepared 3, AP2017FRQ	
12	Week 11: Barron 9 - Design Pattern 2 Be Prepared 4, AP2018FRQ	
13	Week 12: Design Pattern 3 Be Prepared 5, AP2019FRQ	
14	Week 13: Exit review for review course: AP 2015 Exam Multiple Choice	

FREMONT UNIFIED SCHOOL DISTRICT

INSTRUCTIONAL CALENDAR
SCHOOL YEAR 2019-2020

Important Dates

DAYS LISTED BELOW ARE NON-SCHOOL DAYS FOR STUDENTS

Teacher Workdays
August 27, 2019
June 11, 2020

Staff Development Days
August 22, 2019
August 23, 2019
August 26, 2019

Parent Conferences
November Nov. 25, 2019
November Nov. 26, 2019
(Sites may vote to hold conferences on alternate dates and times. Check with school site.)

Non Work Day
April 10, 2020

VACATION & HOLIDAYS

Independence Day: July 4
Labor Day: Sept. 2
Veterans Day: Nov. 11
Thanksgiving: Nov. 27-29
Winter Break: Dec. 23 - Jan. 3
M.L.King Jr.: Jan. 20
Presidents' Day: Feb. 17
Spring Break: April 13-17
Memorial Day: May 25

TEACHER WORKDAY
FIRST & LAST DAYS OF SCHOOL
VACATIONS, NON WORK DAYS & HOLIDAYS
STAFF DEV. DAYS
PARENT CONFERENCES

July-19

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Aug-19

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

3

Sep-19

S	M	T	W	T	F	S
1	~~2~~	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

20

Oct-19

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

23

Nov-19

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	~~11~~	12	13	14	15	16
17	18	19	20	21	22	23
24	~~25~~	~~26~~	~~27~~	~~28~~	~~29~~	30

15

Dec-19

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	~~23~~	~~24~~	~~25~~	~~26~~	~~27~~	28
29	~~30~~	~~31~~				

15

Jan-20

S	M	T	W	T	F	S
			~~1~~	~~2~~	~~3~~	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	~~20~~	21	22	23	24	25
26	27	28	29	30	31	

19

Feb-20

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	~~17~~	18	19	20	21	22
23	24	25	26	27	28	29

19

Mar-20

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

22

Apr-20

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	~~10~~	11
12	~~13~~	~~14~~	~~15~~	~~16~~	~~17~~	18
19	20	21	22	23	24	25
26	~~27~~	~~28~~	29	30		

16

May-20

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	~~25~~	26	27	28	29	30
31						

20

Jun-20

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

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For more details, visit us on the FUSD web site www.fremont.k12.ca.us
From the home page click on "Our District/Calendar"

Board of Education
Meetings are held on the 2nd & 4th Wednesdays in the Board Room at the District Office unless otherwise specified.

Coding Bat

A

L
A
B

B

R

E

Off

Note:
- 2 Spring Break Sessions are float days
- Schedule is subject to adjustments