CTE AP COMPUTER SCIENCE

PS 1 Explain and model concepts in computer science using multiple communication modes (including, for example, oral descriptions, written descriptions, pictures, flowcharts, example code, and pseudocode).

PS 2 Write programs that conform to stylistic conventions for syntax, structure, identifier selection, and commenting.

PS 3 Describe what a program will do by tracing each statement by hand, correctly keeping track of flow of control, variable values, and output produced.

PS 4 Decompose a procedure into multiple methods so that each method has high cohesion with itself and low dependency on other methods; explain why decomposition is useful and how it can be accomplished.

PS 5 Develop multiple test cases that verify the behavior of a method or program; describe how testing can be used to support program verification.

PS 6 Compare between and choose appropriate programming constructs, algorithms, and/or data structures that can be used to implement a solution to a specific problem; describe the trade-offs among the solutions in terms of clarity, readability, efficiency, and how idiomatic they are.

PS 7 Describe and analyze the digital binary representations of primitive data types and the limits they impose; evaluate arithmetic expressions that use numbers in various base systems.

PS 8 Compare between and choose appropriate types to store specific values, casting between types when necessary; explain how using primitive types and reference types affect how and when values can be modified.

PS 9 Construct statements and Boolean expressions that behave as intended using arithmetic, unary, conditional, and relational operators and methods.

PS 10 Declare and/or instantiate variables, objects, arrays, and lists, initializing them appropriately when necessary; describe how scope affects where and when variables can be used.

PS 11 Design, analyze, and implement programs that use conditional structures to respond to different program states or inputs by executing different blocks of code.

PS 12 Design, analyze, and implement methods from an interface or abstract method specification, subject to stated preconditions and guaranteeing stated postconditions.

PS 13 Design, analyze, and implement programs that use iteration, both definite and indefinite, to execute repeated and related actions in generalized ways.

PS 14 Compose, manipulate, and format String objects; access data from and store data to local objects, user consoles, or external files.

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PS 15 Explain the difference between run-time errors and compile-time errors in programs and use information from exceptions and errors to identify the source of a problem.

PS 16 Access and manipulate data stored in lists, one-dimensional arrays, and two-dimensional arrays; implement and explain common algorithms such as traversal, sorting, search, insertion, and deletion.

PS 17 Describe and model specific objects as a grouping of their state and behavior; interpret interface documentation to correctly use classes and methods that were written by others.

PS 18 Specify fields and methods for an interface or class, using the public, private, and static keywords appropriately based on object-oriented design principles.

PS 19 Design, analyze, and implement classes that use abstraction and/or encapsulation to separate the intended behavior of an object from its implementation.

PS 20 Design, analyze, and implement classes that use inheritance, composition, and/or polymorphism to consolidate common behavior and structure between multiple objects.

Common Core

PS 21 9-10.RST.4 Determine the meaning of symbols, key terms, and other domain specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

PS 22 9-10.RST.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

PS 23 9-10.WHST.6 Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.

PS 24 9-10.WHST.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation