

Test Bank for Readings from Programming with Python 1st McMullen

Module 01: Computational Thinking

1. Which term refers to a series of finite steps for solving a problem or carrying out a task?

- a. pattern
- b. algorithm
- c. decomposition
- d. level of abstraction

ANSWER: b

2. Programming algorithms specify the underlying logic for the statements in a computer program.

- a. True
- b. False

ANSWER: True

3. Which statement best describes a computer program?

- a. It is a set of instructions that performs a specific task when executed by a digital device.
- b. It is a set of instructions executed in an application that specify the attributes for a classification of objects.
- c. It is a series of patterns that serve as the blueprints for a programming algorithm.
- d. It is a set of steps that specifies the underlying logic and structure for a classification pattern executed in an application.

ANSWER: a

4. One example of an algorithm used in an everyday technology application is _____.

- a. the decision to purchase a smartphone
- b. the structural decomposition process
- c. the Python programming language
- d. the payment process at an online store

ANSWER: d

5. Often, more than one programming algorithm can be used to effectively solve a problem or perform a task.

- a. True
- b. False

ANSWER: True

6. Why are computer scientists interested in algorithm efficiency?

- a. Efficient algorithms increase the security of computer programs.
- b. Efficient algorithms always produce a programming blueprint that can easily be applied to any programming language.
- c. Efficient algorithms produce simple, straightforward computer programs with very few lines of code.
- d. Efficient algorithms tend to produce computer programs that operate efficiently, quickly, and reliably.

ANSWER: d

7. An effective algorithm _____.

- a. applies to only one specific input
- b. terminates only upon user request
- c. produces at most one output

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d. produces one or more outputs

ANSWER: d

8. One way a programmer can devise an efficient algorithm for accomplishing a simple, everyday technology application is to use a standard algorithm.

a. True

b. False

ANSWER: True

9. A programmer who can't find a standard algorithm to accomplish a task can formulate a new algorithm by stepping through the process manually, recording those steps, and then analyzing their effectiveness.

a. True

b. False

ANSWER: True

10. To select an efficient algorithm for a use case, a programmer uses a set of techniques designed to formulate problems and their solutions known as _____.

a. algorithm termination closure

b. standard algorithm processing

c. computational thinking

d. hierarchical modeling

ANSWER: c

11. What term refers specifically to the process of dividing a complex problem into smaller parts?

a. abstraction

b. decomposition

c. computational thinking

d. pattern identification

ANSWER: b

12. Why is decomposition an important tool for computer scientists?

a. It creates algorithm designs with a flat layout, leading to programs that are more efficient.

b. It creates algorithm designs with a high level of abstraction, leading to programs that are more efficient.

c. It creates algorithm designs with a low level of abstraction, leading to programs that are more efficient.

d. It creates algorithm designs with more manageable pieces, leading to programs that are more efficient and maintainable.

ANSWER: d

13. A programmer uses decomposition when devising an algorithm for a complex problem or task.

a. True

b. False

ANSWER: True

14. Which phrase describes an example of structural decomposition?

a. using algorithmic pattern recognition to identify possible variables

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- b. diagramming a mobile banking app as a hierarchy of building-block units
- c. breaking down a two-factor authentication module into smaller actions, processes, or steps
- d. looking for two-factor authentication logical and physical objects that a computer program will manipulate

ANSWER: b

15. Which phase describes an example of functional decomposition?

- a. using algorithmic pattern recognition to identify possible variables
- b. diagramming a mobile banking app as a hierarchy of building-block units
- c. breaking down a two-factor authentication module into smaller actions, processes, or steps
- d. looking for two-factor authentication logical and physical objects that a computer program will manipulate

ANSWER: c

16. Which phrase describes an example of object-oriented decomposition?

- a. using algorithmic pattern recognition to identify possible variables
- b. diagramming a mobile banking app as a hierarchy of building-block units
- c. breaking down a two-factor authentication module into smaller actions, processes, or steps
- d. looking for two-factor authentication logical and physical objects that a computer program will manipulate

ANSWER: d

17. Suppose a programmer is functionally decomposing a two-factor authentication process. Which step requires further decomposition before it can become a step in an algorithm?

- a. Prompt for user ID.
- b. Prompt for password.
- c. Generate a one-time PIN.
- d. Validate that user ID and password match.

ANSWER: d

18. What statement describes how dependencies and cohesion relate to decomposition?

- a. An effective breakdown maximizes dependencies among the various parts.
- b. An effective breakdown minimizes cohesion among the various parts.
- c. An effective breakdown maximizes dependencies and minimizes cohesion among the various parts.
- d. An effective breakdown minimizes dependencies and maximizes cohesion among the various parts.

ANSWER: d

19. Which term refers specifically to the process of finding similarities in procedures and tasks?

- a. pattern identification
- b. decomposition
- c. computational thinking
- d. abstraction

ANSWER: a

20. Which idea represents an example of a fill-in-the blank pattern?

- a. looking for patterns in an algorithm that allow the algorithm to work for any input number value
- b. allowing three password entry attempts before locking a user out of an online account

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- c. defining a class called “Restaurant” with attributes of restaurant name, hours of operation, and menu
- d. using a variable to represent many different numbers

ANSWER: a

21. Which idea represents an example of a repetitive pattern?

- a. looking for patterns in a template used to specify the attributes for an abstract object
- b. allowing three password entry attempts before locking a user out of an online account
- c. defining a class called “Restaurant” with attributes of restaurant name, hours of operation, and menu
- d. using a variable to represent many different numbers

ANSWER: b

22. What phrase identifies an example of a single object template, or class, from a classification pattern?

- a. social media subscriber
- b. restaurant name, hours of operation, and menu
- c. a user ID, a password, and a mobile number
- d. car color, make, model, and VIN number

ANSWER: a

23. Recognizing that each user of a social media site has a login credential set is an example of pattern identification.

- a. True
- b. False

ANSWER: True

24. Which term refers to a technique that hides details, simplifies complexity, and substitutes a generalization for something specific?

- a. computational thinking
- b. pattern identification
- c. abstraction
- d. decomposition

ANSWER: c

25. Which statement describes why abstraction is an important computer science concept?

- a. It provides a means to hide implementation details from the user to simplify subsequent development and promotes software reuse.
- b. It allows a complex application to be divided into smaller modules.
- c. It ensures a computer program will continue to work efficiently as the size of the data set grows.
- d. It ensures the correct application classes are assigned to the correct attribute.

ANSWER: a

26. Which example illustrates how abstraction can help identify variables?

- a. Abstraction can be used in functional design to identify the classes related to variables.
- b. Abstraction can be used in functional design to identify the attributes related to variables.
- c. Abstraction can be used in object-oriented design to identify the objects related to variables.
- d. Abstraction can be used in pattern recognition to identify possible variables.

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ANSWER: d

27. A login credentials template used in a social media application is an example of an abstraction that contains a set of attributes.

- a. True
- b. False

ANSWER: True

28. Which example illustrates how a class can be used as an abstraction?

- a. A programmer creates a class to represent the temperature required to boil water in degrees Celsius.
- b. A programmer creates a class to represent the temperature required to freeze water in degrees Celsius.
- c. A programmer creates a class to handle a recognized pattern of attributes required to describe a glassware product.
- d. A programmer creates a class to handle the value of the mathematical construct pi.

ANSWER: c

29. Which statement describes how the black box concept is an implementation of abstraction?

- a. A black box produces an output by using unique templates that utilize abstract variables.
- b. A black box produces an output by creating a classification pattern.
- c. A black box produces an output while hiding the inner workings of a process.
- d. A black box produces an output by implementing pattern identification.

ANSWER: c

30. Abstracting out too much detail can make a program too specific to work with a wide variety of data.

- a. True
- b. False

ANSWER: False