

Exam Dumps Foundations-of-Computer-Science Collection, Reliable Foundations-of-Computer-Science Test Notes

COMP107 2022

COMP107W: Foundations of Computer Science
Test 2

Duration: 50 min Total Marks: 50

NOTE: You must simplify your answers as much as possible. Your solutions must be clear and handwritten with student number included or you may not receive any marks. Make use of the reference sheet provided.

1. Based on an expression or set of expressions of Sentential Logic, state whether the following are True or False. Provide a reason for your answer.

- a) A partial truth table of 1 row is required to prove an expression is logically contingent. [2]
- b) A partial truth table of 1 row is required to prove a set of expressions to be logically consistent. [2]
- c) A complete truth table is required to prove that 2 such expressions are logically equivalent. [2]
- d) A partial truth table of 2 rows is required to prove an expression is not a tautology. [2]

2. Translate the below sentences into Sentential Logic concisely using the key provided.

- a) Obi-Wan and Anakin are not Jedi Knights. [2]
- b) Darth Vader is not a Sith Lord only if Obi-Wan is a Sith Lord and Palpatine is not. [2]
- c) In the case that Obi-Wan is a Jedi Knight then either Darth Vader or Anakin is a Sith Lord. [2]

Symbolization Key:
O: Obi-Wan is a Jedi Knight
W: Obi-Wan is a Sith Lord
A: Anakin is a Jedi Knight
S: Anakin is a Sith Lord
D: Darth Vader is a Sith Lord
P: Palpatine is a Sith Lord

3. a) Use the rules of Boolean Algebra to simplify as much as possible. State the rules used on each step of simplification.

$\neg L \vee (((\neg S \vee T) \wedge S) \vee (L \wedge T))$ [9]

b) Prove that your answer to 3.a is correct with the use of a truth table. Show all working. [5]

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qualification. Obviously, this calls for lots of practice. Taking Dumps4PDF Foundations-of-Computer-Science Practice Exam helps you get familiar with the WGU Foundations of Computer Science (Foundations-of-Computer-Science) exam questions and work on your time management skills in preparation for the real WGU Foundations of Computer Science (Foundations-of-Computer-Science) exam.

WGU Foundations of Computer Science Sample Questions (Q21-Q26):

NEW QUESTION # 21

How can someone subset the last two rows and columns of a 2D NumPy array?

- A. `array[-1;, -1:]`
- B. `array[-2;, :]`
- C. `array[:, -2:]`
- **D. `array[-2;, -2:]`**

Answer: D

Explanation:

NumPy slicing uses the same start/stop rules as Python sequences, and it also supports negative indices to count from the end. In a 2D array, slicing is written as `array[rows, columns]`. To get the last two rows, you use `-2:` in the row position, meaning "start two rows from the end and go to the end." Similarly, to get the last two columns, you use `-2:` in the column position. Combining these gives `array[-2;, -2:]`, which selects the bottom-right 2×2 subarray.

Option A, `array[-2;, :]`, selects the last two rows but all columns, so it is not restricted to the last two columns.

Option D, `array[:, -2:]`, selects all rows but only the last two columns. Option B, `array[-1;, -1:]`, selects only the last row and the last column, producing a 1×1 (or 1×1 view) subarray, not a 2×2 .

This kind of slicing is widely taught because it is essential for matrix operations, extracting submatrices, working with sliding windows, and manipulating image or time-series data where "take the last k observations/features" is common. Negative indexing reduces errors and makes code clearer, especially compared with computing explicit indices like `array[rows-2:rows, cols-2:cols]`.

NEW QUESTION # 22

What is the purpose of user management and access control in a networked environment?

- A. To provide unlimited access to all network resources
- B. To restrict all users from accessing confidential documents
- **C. To establish permissions and monitor resource usage**
- D. To ensure all users have the same level of access to resources

Answer: C

Explanation:

In a networked environment, user management and access control exist to ensure that resources are used securely, appropriately, and accountably. The core idea is authorization: defining what each user (or group of users) is allowed to do—read files, modify data, access applications, administer systems, and so on. This is commonly guided by the principle of least privilege, which states that users should receive only the permissions necessary to perform their tasks. Proper access control reduces the damage from mistakes and limits the impact of compromised accounts.

User management also includes authentication support (ensuring a user is who they claim to be) and administrative functions such as creating accounts, assigning roles, revoking access, and enforcing policies (password rules, multi-factor authentication requirements, session timeouts). In many systems, access control is implemented through models like discretionary access control (DAC), role-based access control (RBAC), or mandatory access control (MAC), each with different security properties.

Option B correctly reflects this: the goal is to establish permissions and to monitor or audit usage (logging access, tracking changes, detecting suspicious behavior). Option A is wrong because equal access is rarely secure or practical. Option C is the opposite of secure practice. Option D is too absolute:

systems typically restrict some users from some confidential resources, not all users from all confidential documents.

NEW QUESTION # 23

What is an ndarray in Python?

- A. A native Python object that represents a tree-like hierarchical data structure.
- B. A built-in Python data array used to store collections of items.

- C. A module that provides network socket functions similar to XML.
- **D. An n-dimensional array object provided by the NumPy library.**

Answer: D

Explanation:

An ndarray is NumPy's fundamental data structure: an n-dimensional array designed for efficient numerical computation. The term stands for "N-dimensional array," and it is implemented as `numpy.ndarray`. Unlike Python's built-in list, an ndarray stores elements in a compact, homogeneous format defined by its dtype (such as integers or floating-point numbers). This uniform representation enables fast, vectorized operations and efficient use of memory, which is why ndarray is central in scientific computing and data analysis.

An ndarray supports multiple dimensions: a 1D array behaves like a vector, a 2D array like a matrix (rows and columns), and higher-dimensional arrays represent tensors. Textbooks emphasize that ndarray operations are typically element-wise by default (for example, `a + b` adds corresponding elements), and that slicing and broadcasting allow powerful computations without explicit loops. This approach is both expressive and efficient because the heavy lifting happens in optimized low-level code.

Option A is incorrect because ndarray is not built into core Python; it comes from NumPy. Option B describes a tree, which is a different data structure entirely. Option D is incorrect because sockets and XML-related functionality belong to other parts of Python's standard library, not to NumPy or ndarray.

In short, an ndarray is the primary array object of NumPy, providing high-performance multi-dimensional numerical storage and computation.

NEW QUESTION # 24

What is the correct way to convert an integer to a string in Python?

- A. `tostring(variable)`
- **B. `str(variable)`**
- C. `int_to_str(variable)`
- D. `string(variable)`

Answer: B

Explanation:

Python provides built-in type conversion functions that construct a value of a target type from a supplied object when possible. To convert an integer to a string, Python uses the constructor function `str()`. For example, `str(42)` produces the string "42". This operation is fundamental in programming textbooks because it enables tasks like formatting output, concatenating numbers into messages, building file names, or preparing numeric values for text-based storage and transmission.

Python distinguishes clearly between numeric types (`int`, `float`) and text type (`str`). You cannot concatenate an integer directly with a string (e.g., `"Age: " + 30` raises a `TypeError`) because the types are different. Using `str(30)` resolves this by converting the integer into its string representation: `"Age: " + str(30)` becomes valid.

Modern Python commonly uses f-strings (`f"Age: {30}"`), which perform conversion automatically, but `str()` remains the canonical and explicit method.

Options A, B, and C are not standard Python built-ins for conversion. While some libraries define helper functions with similar names, the language's standard approach is `str(...)`. Textbooks also highlight that `str()` is not limited to integers: it can convert many objects into readable string representations, often by invoking the object's `__str__` method. This ties conversion to Python's object model and supports consistent display and logging across programs.

NEW QUESTION # 25

Which Python function would be used to check the data type of a variable `bmi`?

- **A. `type(bmi)`**
- B. `datatype(bmi)`
- C. `typeof(bmi)`
- D. `check(bmi)`

Answer: A

Explanation:

Python provides the built-in function `type()` to determine the data type (more precisely, the class) of an object. Because Python is dynamically typed, variable names are references to objects, and the object itself carries its type information at runtime. Calling

`type(bmi)` returns a type object such as `<class 'int'>`, `<class 'float'>`, or `<class 'str'>` depending on what value is currently bound to the name `bmi`. This is the standard, textbook-approved method for checking an object's type in Python.

Option C, `typeof(bmi)`, is common in JavaScript, not Python. Options A and B are not standard Python built-ins; they might exist in user code or other languages, but not in Python's core language. In typical coursework and professional usage, `type()` is the correct function.

Textbooks also discuss how `type()` differs from `isinstance()`. While `type()` directly reports the object's class, `isinstance(bmi, float)` is often preferred when you want to allow subclass relationships. For example, in object-oriented programming, a subclass instance should often be treated as an instance of its parent class, which `isinstance()` supports. However, when the question asks specifically for the function used to "check the data type," the expected answer is `type()`.

Understanding type inspection helps with debugging, writing robust functions, and reasoning about operations that are valid for different data types.

NEW QUESTION # 26

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