NOCTI

Job Ready Pilot Blueprint

Pilot Assessment

Content is Subject To Change Prior to Full Implementation



Computer Programming - Pilot

Code: 4223 / Version: 01

NOCTI

JOB READY ASSESSMENT BLUEPRINT

COMPUTER PROGRAMMING - PILOT

Test Code: 4223
Version: 1

Specific Competencies and Skills Tested in this Assessment:

General Information and Concepts
Demonstrate understanding of common number systems
Display knowledge of the types of programming methodologies and paradigms
Exhibit understanding of scoping and inheritance

Ethics, Legal Compliance, and Security
Display knowledge of use of data security methods and procedures
Display familiarity with concepts of intellectual property
Exhibit knowledge of the application of secure coding practices

Design Program Solutions (Pseudocode)
Demonstrate ability to apply principles of quality and efficient programming
Display understanding of algorithms and algorithmic structures (e.g., design algorithms)
Display understanding of algorithmic thinking in code implementation

Code Programs
Demonstrate basic coding skills (e.g., loops, conditional logic)
Exhibit understanding of implementing error handling in code
Display understanding of iterative design
Demonstrate comprehension of best coding practices (e.g., comment code, naming conventions, project structures)

Test Programs
Distinguish between types of tests
Demonstrate an understanding of input and output validation processes
Display ability to identify bugs and defects
Demonstrate ability to identify test cases
Exhibit understanding of testing usability, accessibility, and user experience

Computer Programming - PILOT (continued)

Data Types and Structures

Display familiarity of non-primitive data types
Demonstrate understanding of collection data types
Identify primitive data types
Exhibit understanding of date and time types
Display understanding of constants and enumerated types
Demonstrate knowledge of performing type conversions

Data Collection and Storage

Identify data collection form features
Demonstrate ability to validate collected data
Display understanding of data storage options (e.g., caching, session storage)
Demonstrate understanding of database concepts (e.g., CRUD)
Exhibit understanding of common file types

User Interface and User Experience

Display understanding of human factors in UI/UX design basics
Demonstrate understanding of accessibility in design
Identify prototype development methods
Evaluate elements of responsive design

Written Assessment:

Administration Time: 2 hours and 30 minutes
Number of Questions: 125

Areas Covered:

10% General Information and Concepts
7% Ethics, Legal Compliance, and Security
10% Design Program Solutions (Pseudocode)
21% Code Programs
12% Test Programs
15% Data Types and Structures
14% Data Collection and Storage
11% User Interface and User Experience

Sample Questions:

Which number system uses only the digits 0 and 1 and is commonly used by computers to represent data?

A. binary
B. decimal
C. hexadecimal
D. octal

Which intellectual property protection is associated with identifying a software product's name or logo?

A. patent
B. copyright
C. trademark
D. trade secret

Which algorithmic structure repeats a set of instructions until a condition is met?

A. array
B. loop
C. class
D. stack

Which programming technique is used to manage unexpected errors during program execution without causing the program to crash?

A. exception handling
B. variable declaration
C. data sorting
D. loop control

In iterative design, the process of repeatedly improving a program based on testing and feedback is

A. encryption
B. deployment
C. compilation
D. refinement

Input validation is used in a computer program to

A. store backups
B. prevent errors
C. create graphics
D. generate reports

What is the primary purpose of analyzing program logs when troubleshooting software issues?

A. find errors
B. create backups
C. design interfaces
D. compress files

Which is a non-primitive data type used to represent a real-world object with attributes and behaviors?

A. integer
B. float
C. Boolean
D. class

Which file type is commonly used to store source code for a Python program?

A. .txt
B. .py
C. .jpg
D. .mp3

Which accessibility feature helps users who are unable to use a mouse to interact with a software application?

A. keyboard navigation
B. color themes
C. screen layout
D. image scaling

Performance Assessment:

Administration Time: 1 hours and 45 minutes
Number of Jobs: 5

Areas Covered:

9% **Critical Thinking/Analysis**

Participant will analyze raw performance data and calculate requested metrics, such as data type(s) for views and likes, errors that occurred, and expected outputs.

24% **Write a Function/Method**

Participant will create and run a function that calculates a title's engagement rate from likes and views, assigns the correct level, and reports the result for review.

13% **Data File Encoding**

Participant will use provided data and format it as a delimited CSV comma (data table).

29% **File I/O and Error Handling**

Participant will create a program that loads media data from a JSON or CSV file into data structures, handles missing or invalid file data without crashing, displays errors or records loaded, and properly releases file resources.

25% **Loops and Conditional Logic**

Participant will develop a program that searches an array for specified integer values and reports whether each value is found.

Sample Job: File I/O and Error Handling

Maximum Job Time: 20 minutes

Participant Activity: Participant will create a program that reads data from a JSON or CSV file, loads it into a set of data structures, handles missing files or improperly formatted data without crashing, and displays the errors or number of records loaded. The participant will also ensure the program properly releases file resources before saving and submitting the source code and output.