MWSUG 2026 Presentations Quiz

Instructions:

1) **Prepare the Answer Sheet:** Print off or Save the Answer Sheet into a separate file so that you can read the questions and jot down your answer into the answer sheet as you go along without having to navigate back and forth.
2) **Answer the Questions:** The questions are organized by section, so you can answer them in order or skip around by Ctrl+Click from the Table of Contents to the sections you think are most relevant. If a section is collapsed, use the carrot to the left of the header to show the questions. Jog your answers in the Answer Sheet.
3) **Grade your Quiz:** Once you have answered the questions, use the Answer Key to see if you got the answers correct! Use the last column to keep track.
4) **Identify the related talks:** Review the "Paper Presentations" page of the www.mwsug.org website: https://mwsug.org/2026/papers. Identify the question for each talk by its Paper No./Talk ID. This is listed after the Question Number in the Answer Sheet and the Question itself. (For example, AS-008 is Leveraging AI: A Programmer's Roadmap by Kirk Paul Lafler in the AI, Statistics, and Analytic Methods section).

Contents

Answer Sheet 34

Answer Key 34

AI, Statistics and Analytic Methods Section 5

- Question for AS-008 5
- Question for AS-029 5
- Question for AS-034 5
- Question for AS-058 6
- Question for AS-059 6
- Question for AS-067 6
- Question for AS-068 6
- Question for AS-070 7
- Question for AS-075 7
- Question for AS-086 7
- Question for AS-087 8

Question for AS-092 8
Question for AS-099 8
Question for AS-108 8
Advanced Programming Section 10
Question for AP-009 10
Question for AP-016 10
Question for AP-037 10
Question for AP-039 11
Question for AP-044 11
Question for AP-046 11
Question for AP-061 11
Question for AP-062 12
Question for AP-072 12
Question for AP-077 12
Question for AP-084 12
Question for AP-095 13
Question for AP-097 13
Question for AP-100 13
Basic and Intermediate SAS Coding Section 14
Question for BI-007. 14
Question for BI-043. 14
Question for BI-050. 14
Question for BI-051. 15
Question for BI-079. 15
Question for BI-080. 15
Question for BI-094. 15
Data Visualization and Reporting Section 17
Question for DV-005 17
Question for DV-010 17
Question for DV-011 17
Question for DV-021 17
Question for DV-036 18

Question for DV-040 18
Question for DV-045 18
Question for DV-049 18
Question for DV-071 19
Question for DV-078 19
Question for DV-090 19
Question for DV-091 20
Question for DV-102 21
Question for DV-106 21
E-Posters Section 22
Question for EP-006 22
Question for EP-033 22
Question for EP-060 22
Question for EP-098 23
Question for EP-105 23
Hands On-Workshops and Live Demos Section 24
Question for HD-003 24
Question for HD-012 24
Question for HD-013 24
Question for HD-018 25
Question for HD-030 25
Question for HD-042 25
Question for HD-057 25
Question for HD-069 26
Question for HD-081 26
Question for HD-083 26
Open Source Development and Tools Section 27
Question for OS-027 27
Question for OS-031 27
Question for OS-041 27
Question for OS-048 27
Question for OS-073 28

Question for OS-076 28
Question for OS-082 28
Question for OS-085 29
Question for OS-093 29
Question for OS-103 29
Question for OS-104 29
Question for OS-109 30
Question for OS-110 30
Pharma and Healthcare Section 31
Question for PH-019 31
Question for PH-035 31
Question for PH-038 31
Question for PH-047 31
Question for PH-052 32
Question for PH-089 32
Question for PH-096 32
Question for PH-107 33
Answer Sheet 34
Answer Sheet – continued 35
Answer Key 36

AI, Statistics and Analytic Methods Section

Question for AS-008

What is the primary purpose of the presentation "Leveraging AI: A Programmer's Roadmap"?

A. To teach programmers how to build foundational large language models from scratch using Python.

B. To provide a practical, step-by-step roadmap for programmers looking to thrive in an AI-driven environment.

C. To announce the complete replacement of traditional programming languages with natural language prompts.

D. To debate the legal regulations and government policies restricting AI development in the tech industry.

Question for AS-029

When is an ANFIS most useful?

A. An ANFIS is most useful when a problem is easily formulated for solution by standard well-established techniques.

B. An ANFIS is most useful when there are only a few variables whose behavior is well-defined.

C. An ANFIS is most useful when a problem is not precisely defined and cannot be easily formulated using classical problem-solving techniques.

D. An ANFIS is most useful when the variables involved are independent of each other and can be linearly separated.

Question for AS-034

In statistical modeling and data analysis, what does "data drift" typically refer to?

A. A constant variance of error terms across all levels of independent variables

B. Changes in the underlying population over time causing newer data to behave differently than historical training data

C. The complete absence of records in a primary tracking table

D. The random sorting order of rows in a DATA step execution

Question for AS-058

In logistic regression, what does the standard logistic function, represented mathematically as 1/(1+exp(-x)), ensure about the predicted probabilities?

A. That the predicted values are constrained strictly between 0 and 1

B. That the output values grow exponentially without an upper bound

C. That variance is completely eliminated from the model residuals

D. That the dependent variable is treated as a continuous normal distribution

Question for AS-059

Within GxP-regulated clinical programming environments, what is the primary role of a Requirements Traceability Matrix (RTM)?

A. To execute automated SAS DATA steps in parallel across cloud servers

B. To compress permanent SAS datasets to save storage space

C. To link functional requirements and specifications directly to corresponding test cases and validation results

D. To format statistical tables for ODS PDF generation

Question for AS-067

When analyzing stratified 2x2 contingency tables in epidemiology, which statistical concepts assess whether the association between an exposure and an outcome is modified by a third variable or distorted by a extraneous factor?

A. Effect modification (interaction) and confounding

B. Convergence and iteration limits

C. Heteroscedasticity and multicollinearity

D. Type I error and statistical power

Question for AS-068

What is a primary performance advantage of executing modern analytics code on the SAS Cloud Analytic Services (CAS) server in SAS Viya?

A. Sequential single-threaded processing on local hard drives

B. In-memory and parallel data processing across distributed nodes

C. Automatic translation of SAS code into Java bytecode

D. Elimination of all data step syntax requirements

Question for AS-070

Why use PROC SURVEYFREQ instead of PROC FREQ on survey data?

A. Faster sorting

B. Handles complex survey weights and design

C. Creates macros automatically

D. Avoids missing values

Question for AS-075

Which SAS procedure supports Hidden Markov Models in Viya?

A. PROC REG

B. PROC GLM

C. PROC HMM

D. PROC MEANS

Question for AS-086

Which machine learning method generally uses labeled outcome data?

A. Unsupervised learning

B. Clustering

C. Supervised learning

D. Dimension reduction

Question for AS-087

What does RAG stand for?

A. Retrieval-Augmented Generation

B. Routine AI Governance

C. Recursive Agent Generation

D. Reporting Analysis Graph

Question for AS-092

In clinical trial programming, what is the traditional purpose of independent double programming (producing separate production and validation programs)?

A. To double the speed of data step compilation in Base SAS

B. To ensure quality control and error detection by verifying that two independently written programs yield identical results

C. To generate dual ODS HTML reports simultaneously

D. To automatically populate SDTM domain metadata from Word documents

Question for AS-099

When analyzing legacy codebases during a software modernization initiative, what is a primary benefit of generating automated data lineage and flowcharts?

A. Bypassing the need for software license renewals

B. Eliminating all syntax errors prior to compilation

C. Converting SAS datasets directly into relational SQL databases

D. Understanding how data variables, transformations, and dependencies flow through complex programs

Question for AS-108

What is the primary objective of Diagnostic Classification Models (DCMs) in psychometrics and educational testing?

A. To compute a single continuous overall test score without item-level details

B. To optimize macro variable substitution rates in SAS workflows

C. To classify individuals according to their mastery or nonmastery profiles of multiple fine-grained cognitive attributes or skills

D. To determine the optimal cluster bandwidth for spatial map projections

Advanced Programming Section

Question for AP-009

How does an organization know when an application needs modernizing?

A. Performance and Scalability Bottlenecks, Escalating Maintenance and Support Costs, and Integration and Interoperability Friction.

B. Application modernization is required if and only if the primary programming language or database engine drops free community support.

C. Stable applications operating without recent bug fixes or support tickets are prime candidates for immediate modernization.

D. An increase in user adoption and transaction volume is a definitive sign that a legacy application is failing.

Question for AP-016

In enterprise systems architecture, what phenomenon describes the tendency of large datasets and their associated processing workloads to attract applications rather than moving the data elsewhere?

A. Network latency

B. Memory fragmentation

C. Schema normalization

D. Data gravity

Question for AP-037

When dealing with raw data export files (such as delimited text or CSV) across different computing environments, what is the most effective programming practice to avoid repetitive manual code edits for file paths and library references?

A. Hardcoding local Windows file paths directly into every production program

B. Parameterizing directory paths and environment settings using reusable SAS macros or configuration variables

C. Converting every CSV file manually using spreadsheet software

D. Deleting all format catalogs before each execution

Question for AP-039

What's a valid reason to avoid the DATA STEP to improve the performance of your SAS code?

A. It creates unnecessary temporary SAS data sets which take up storage space.

B. It involves an extra pass through the data by reading and writing data

C. It utilizes disk-based processing which isn't as efficient as memory-based processing.

D. All of the Above.

Question for AP-044

In SAS programming, what common warning or note in the log often indicates a potential data mismatch or implicit type coercion issue during a DATA step execution?

A. Successful dataset creation note

B. Macro symbol table compilation note

C. Character-to-numeric conversion note

D. Default page break notice

Question for AP-046

Which combination of Base SAS capabilities is used to automatically generate source-to-target documentation from legacy SAS programs?

A. PRX functions for dataset and metadata extraction, combined with SAS system options for macro expansion.

B. SAS Visual Analytics dashboards to automatically reconstruct source code and business rules.

C. PROC FREQ and PROC MEANS to generate source-to-target mappings from statistical summaries.

D. External Python parsing libraries and third-party ETL tools, which are required to analyze SAS code.

Question for AP-061

Which version control system is widely utilized in modern multi-language analytics development for tracking code changes and enabling team collaboration across SAS, Python, and R?

A. Git

B. FTP file transfer client

C. Fixed-record text editor

D. COBOL compiler manager

Question for AP-062

What is one way to repeatedly merge linked records until the groups stop changing?

A. Fuzzy Matching

B. Recursive Merging

C. Internal Propagation

D. Clustering

Question for AP-072

In text manipulation functions such as TRANSLATE and TRANSWRD in SAS, what is a key operational difference between them?

A. TRANSLATE requires an active ODS destination, whereas TRANSWRD runs exclusively in batch mode

B. TRANSLATE only works on numeric variables, while TRANSWRD operates strictly on graphics templates

C. TRANSLATE deletes observations, while TRANSWRD inserts new rows into a dataset

D. TRANSLATE replaces individual characters positionally, whereas TRANSWRD replaces entire words or substrings

Question for AP-077

In the SAS macro language, what statement or feature is commonly used to create macro variable arrays or store lists of values for iterative processing?

A. PROC SORT index creation tables

B. ODS OUTPUT trace routing targets

C. Data step CALL SYMPUTX combined with looping statements (such as %DO)

D. Permanent SAS library engine assignments

Question for AP-084

When designing modular and reusable SAS macro programs, what is the primary benefit of parameterization?

A. It allows the same underlying code structure to process different datasets and conditions without modifying the core program logic

B. It eliminates the need to review execution logs

C. It automatically converts all character variables into numeric arrays

D. It forces SAS to execute programs exclusively on single-threaded CPUs

Question for AP-095

During data cleaning and validation in a SAS DATA step, which statement or programming technique is commonly used to conditionally execute error-handling logic when an anomaly is detected?

A. IF-THEN statements coupled with OUTPUT or PUT statements to flag invalid records

B. Disabling log generation entirely

C. Deleting the entire SAS permanent library catalog

D. Forcing a system crash using operating system commands

Question for AP-097

In standard SAS batch execution, what typically happens to existing log and listing files if a program is rerun with the same output path and filenames without customization?

A. They are appended with sequential numbers in the root directory

B. They are overwritten by the new execution results

C. They are automatically archived into a ZIP file

D. They prompt the user for interactive confirmation before saving

Question for AP-100

When writing high-performance SAS programs, which practice helps minimize CPU and memory overhead during data processing?

A. Reading entire unindexed multi-gigabyte tables into macro variables

B. Writing debug print statements for every single observation

C. Avoiding dataset compression entirely under all circumstances

D. Keeping only necessary variables and observations using KEEP, DROP, and WHERE statements early in the step

Basic and Intermediate SAS Coding Section

Question for BI-007

Which of the following statements accurately highlights a core design difference between PROC REPORT and PROC TABULATE regarding table dimensions and structure?

A. PROC TABULATE is restricted to a maximum of two dimensions (rows and columns), whereas PROC REPORT natively supports three-dimensional tables with pages, rows, and columns.

B. PROC REPORT supports arbitrarily complex multi-dimensional hierarchies and page dimensions, whereas PROC TABULATE limits table dimensions to simplify its COLUMN statement syntax.

C. PROC TABULATE natively supports three-dimensional tables (pages, rows, and columns) with arbitrarily complex nestings and concatenations, whereas PROC REPORT was designed with a simplified COLUMN statement and a restricted number of dimensions.

D. Neither procedure supports summary statistics, requiring users to always rely on a prior execution of PROC SUMMARY or PROC MEANS to output hierarchical tables.

Question for BI-043

How are special missing numeric values represented in SAS data steps (e.g., representing different reasons for missing data)?

A. As a period followed by a letter (e.g., .A through .Z or ._)

B. As character strings enclosed in single quotes ('MISSING')

C. As negative integers (-1 through -99)

D. As null pointer references (NULL)

Question for BI-050

When using PROC SUMMARY or PROC MEANS without the NWAY option, what does the automatic _TYPE_ statistical column represent?

A. The specific combination of classification variables used to compute each summary row

B. The memory allocation buffer size in kilobytes

C. The data type (character or numeric) of the analysis variable

D. The storage engine format of the permanent SAS dataset

Question for BI-051

During the compilation phase of a SAS DATA Step, what primary memory structure is constructed to hold variable values during execution?

A. The Global Macro Symbol Table

B. The Program Data Vector (PDV)

C. The Hash Index Workspace

D. The ODS Output Template Registry

Question for BI-079

When performing a standard one-to-one or match-merge using the MERGE statement in a SAS DATA step without proper safeguards, what common problem occurs if datasets have duplicate key values or unmatched observations?

A. Immediate abortion of the SAS session with a fatal syntax error

B. Automatic conversion of numeric variables into character arrays

C. Permanent deletion of the input datasets from disk

D. Unintended cartesian-like row expansion (mismatched pairing) and overwriting of variables with identical names

Question for BI-080

What is a fundamental distinction between a regular DATA step IF statement and a macro %IF statement in SAS?

A. A regular IF can only process character strings, while %IF processes numeric values exclusively

B. There is no functional difference; both operate identically across all contexts

C. A regular IF executes conditionally during DATA step execution on observations, whereas %IF executes during macro compilation to control code generation

D. A %IF statement can be placed anywhere inside a PROC SQL query, while a regular IF cannot

Question for BI-094

In Base SAS programming, what is the primary advantage of using built-in DATA step functions compared to writing custom conditional logic for string or numeric manipulations?

A. Built-in functions are optimized for performance, handle edge cases efficiently, and require less custom code

B. Built-in functions automatically update permanent database schemas on remote servers

C. Built-in functions bypass the compilation phase of the DATA step

D. Built-in functions eliminate the need for any variable declarations

Data Visualization and Reporting Section

Question for DV-005

What is the primary purpose of a bar chart?

A. To compare values across different categories.

B. To display the relationship between two continuous variables.

C. To show the exact location of data points on a geographic map.

D. To show how a single value changes continuously over time.

Question for DV-010

What is the primary function of activating the ODS GRAPHICS ON; statement prior to running a statistical procedure in SAS?

A. To export all resulting datasets directly into Microsoft Excel spreadsheets

B. To enable statistical procedures to automatically generate high-quality ODS graphics and plots as part of their output

C. To convert character variables into numeric arrays in the PDV

D. To compile SAS macro programs into executable binary files

Question for DV-011

In SAS ODS architecture, what is the purpose of using ODS TRACE ON; before executing a procedure?

A. To trace memory leakage during DATA step compilation

B. To print the names, labels, and path information of all output objects produced by the procedure to the SAS log

C. To record macro variable substitution steps into a text file

D. To generate interactive HTML5 dashboards automatically

Question for DV-021

In SAS, which values for COLOR= are easy to use and reliable?

A. Any color that I can think of

B. Any of the SAS Predefined Color Names

C. Picking a color is fraught with peril. The SAS documentation does not make it easy and simple. There is NO reason to assume that the result will be as you expect. E.g., LightPink is darker than Pink. For any color you choose, test it.

D. Any of the colors in the SAS Registry

Question for DV-036

In spatial data mapping and GIS analysis, what is the primary purpose of applying a map projection?

A. To transform spherical geographic coordinates (latitude and longitude) onto a flat two-dimensional plane while managing spatial distortion

B. To sort geographic polygons alphabetically by county name

C. To compress vector shapefiles into compressed ZIP archives

D. To convert text addresses into numeric missing values in a SAS dataset

Question for DV-040

What is a primary benefit of integrating enterprise analytics platforms like SAS Viya with everyday productivity tools like Microsoft Excel and Word?

A. Converting Word documents into SAS datasets automatically

B. Replacing the need for database storage systems entirely

C. Forcing all end users to learn raw SAS macro programming syntax

D. Enabling seamless collaboration, live data linking, and reporting updates directly within familiar office applications

Question for DV-045

In SAS ODS Graphics, what is the Graph Template Language (GTL) primarily used for?

A. Compiling SAS DATA step code into binary machine instructions

B. Defining and customizing complex statistical graphics and layouts beyond the capabilities of standard SG procedures

C. Executing SQL queries against relational databases

D. Managing server security permissions in SAS Viya

Question for DV-049

In Python-based data science workflows, what are the primary roles of the Pandas library versus Matplotlib/Seaborn?

A. Pandas handles data manipulation and tabular aggregation, whereas Matplotlib and Seaborn handle data visualization and plotting

B. Pandas creates graphical user interfaces, while Matplotlib handles macro variable resolution

C. Pandas manages database security, while Matplotlib executes SQL queries

D. Pandas compiles Python scripts into SAS macros, whereas Seaborn manages operating system files

Question for DV-071

When comparing multi-group data visualizations in SAS ODS Graphics, what is the primary capability of PROC SGPANEL over PROC SGPLOT?

A. Converting raster images into vector shapefiles

B. Generating 3D rotational wireframe surfaces automatically

C. Creating multi-panel lattice grids (panes) of graphs conditioned on one or more classification variables

D. Executing SQL join operations across independent database tables

Question for DV-078

What is a major advantage of using the ODS EXCEL destination in SAS compared to traditional flat file exports?

A. It enables direct generation of formatted multi-sheet Excel workbooks with native styling, formulas, and column widths straight from SAS procedures

B. It restricts output strictly to plain text comma-delimited streams

C. It converts SAS datasets into compiled Java applets

D. It requires all recipient users to install SAS software on their local machines

Question for DV-090

In a multi-line overlay time series plot of Y by Month (as the X value) for several years, what is the best way to enable your viewer to determine Y and X for each point on the line for each year?

A. Color code the plot lines and use the XAXISTABLE statement to provide X axis tables that present lines of Y values above their respective month values. Each row of values can be color-coded to match their plot lines and markers, and each row can be labeled at the left with its Year value.

B. Deliver the plot as an HTML file with data tips to allow the viewer to display the year, month, and Y values as pop-up text with the mouse.

C. Provide as many as possible Y and X axis tick mark values, and provide grid lines.

D. Provide a companion table containing the year, month, and Y values.

Question for DV-091

Which is the most important data graphic ever invented?

A. There are three, not just one. All of them are the most frequently used yet today. William S. Playfair invented the Time Series Plot, the Pie Chart, and was an early creator of Bar Charts. A decade before Playfair's first bar chart, Philippe Buache and Guillaume de L'Isle created a bar chart somewhat like today's bar charts, but with a table of related data imbedded above it in the same image. Nicole Oresme is sometimes described as the first to create a bar chart (around 1350), but that diagram looks NOTHING like a real bar chart.

B. The infographic, which is often information and graphic overload, not an efficient data graphic.

C. The Box Plot

D. The Histogram

Question for DV-102

In data visualization programming, what is a Sunburst chart typically used to represent?

A. Time-series stock market moving averages

B. Hierarchical data structures using concentric rings or tiered radial slices

C. Correlation matrices between continuous regression variables

D. Spatial geographic map projections

Question for DV-106

In SAS software, what is the primary role of the Output Delivery System (ODS)?

A. To execute background operating system shell commands

B. To compile raw SAS macros into macro libraries

C. To manage, format, and route procedure output into various presentation destinations such as PDF, HTML, RTF, and Excel

D. To manage physical memory allocation for large hash tables

E-Posters Section

Question for EP-006

In today's rapidly evolving, technology-driven job market, technical expertise alone is often insufficient for long-term career advancement. Which of the following best describes the combination of soft skills that employers increasingly view as critical for gaining a competitive edge and thriving across diverse roles?

A. Adaptability, emotional intelligence, collaborative communication, and continuous learning.

B. Hyper-focus on individual output, strict adherence to legacy processes, and advanced solo problem-solving.

C. Authoritative leadership, unwavering resistance to organizational change, and compartmentalized task execution.

D. Technical certification accumulation, siloed project management, and minimized peer-to-peer interaction.

Question for EP-033

When using the NOBS= option in a SAS SET statement, why is it important to remember that NOBS is evaluated during compilation before WHERE clause subsetting occurs?

A. Because the observation count reflects the total rows in the input dataset before filtering, not the subsetted row count after WHERE processing

B. Because NOBS automatically deletes records that fail condition checks

C. Because NOBS causes SAS to abort execution if any missing values are present

D. Because NOBS can only be used with macro variables, never DATA step variables

Question for EP-060

In accordance to the e-Poster "AI-Powered Code Review: Using Generative AI to Improve SAS Program Quality, Consistency, and Maintainability," what role should Generative AI play in the software development lifecycle?

A. It should completely replace human oversight in code reviews to eliminate technical debt.

B. It should enhance the development lifecycle by providing rapid, consistent, and context-aware recommendations while relying on human expertise for validation.

C. It should serve as an automated tool to independently approve production readiness and regulatory compliance.

D. It should be used exclusively to write new SAS programs rather than reviewing existing code.

Question for EP-098

In Base SAS reporting, what is the primary purpose of utilizing PROC FORMAT?

A. To compile macro libraries into executable modules

B. To define custom user-defined display formats and value mappings for numeric or character data

C. To execute multithreaded SQL joins across cloud databases

D. To configure server network protocols in SAS Viya

Question for EP-105

Which is the worst: Red and Green to color code for Bad and Good, Too many shades of one hue, Color gradients instead of a discrete color palette.

A. Red and Green to color code for Bad and Good

B. Color gradients instead of a discrete color palette

C. Too many shades of one hue

D. All of them are too bad, and obstruct visual communication.

Hands On-Workshops and Live Demos Section

Question for HD-003

When tuning a SAS data step or PROC SQL query for optimal performance on a massive dataset, which of the following practices is most effective for reducing unnecessary I/O and CPU overhead?

A. Using the DROP= or KEEP= data set options to limit variables processed, combined with index utilization for selective WHERE clause processing.

B. Replacing all numeric variables with character strings to eliminate data type conversion warnings in the SAS log.

C. Increasing the maximum memory allocation (MEMSIZE) to an arbitrarily large value to force SAS to hold all temporary intermediate files in physical RAM.

D. Sorting the entire input dataset by every variable in the table prior to executing any merge or join operation to ensure row ordering.

Question for HD-012

In geospatial analytics and interactive reporting, what file format is commonly used to store vector spatial data containing geographic boundaries and shapes (such as counties or states)?

A. Comma-separated values (.csv)

B. Rich text format (.rtf)

C. SAS configuration file (.cfg)

D. Shapefile (.shp)

Question for HD-013

In Internet of Things (IoT) and AIoT architectures, what does "edge processing" typically refer to?

A. Compiling SAS code on mainframe computers without network connections

B. Processing data locally on devices close to where sensors or cameras capture data rather than sending all raw data to a centralized cloud server

C. Storing permanent SAS catalogs on local hard drives

D. Deleting raw log files automatically after batch execution

Question for HD-018

What is the primary statistical purpose of non-parametric procedures such as PROC NPARWAY in SAS/STAT?

A. To execute linear regression models with strict parametric error assumptions

B. To perform non-parametric tests (such as Wilcoxon or Kruskal-Wallis tests) when data do not meet normal distribution assumptions

C. To compile macro symbol tables iteratively

D. To generate multi-sheet Excel workbooks via ODS EXCEL

Question for HD-030

What is the primary advantage of converting a standalone SAS program into an interactive web-based job (such as in SAS Viya)?

A. Eliminating the requirement for a SAS server backend

B. Forcing users to edit raw SAS code whenever parameters change

C. Allowing non-technical end users to execute analytical routines and generate reports via a browser interface using dynamic parameters

D. Converting SAS datasets into static PDF files permanently

Question for HD-042

When using AI assistants or copilots to generate code snippets, what is a recommended best practice for professional developers?

A. Storing all API keys in plain text within public code repositories

B. Trusting the AI output blindly without reviewing execution logs

C. Disabling all human code reviews entirely

D. Reviewing, testing, and validating all AI-generated code for correctness, security, and edge-case handling before production deployment

Question for HD-057

In SAS reporting procedures like PROC REPORT, what does the concept of a "single pass" through an input dataset signify for performance?

A. That the input dataset must be pre-sorted on every single variable

B. That macro variables cannot be referenced within compute blocks

C. That output is restricted to exactly one single page of text

D. That the procedure reads the entire input dataset into memory/processing once to compute statistics and build the report, saving I/O overhead

Question for HD-069

In marketing research and econometrics, what are discrete choice models typically used to analyze?

A. The decision-making choices made by individuals among a set of discrete, mutually exclusive alternatives or products

B. Text document sentiment clustering

C. Continuous physical measurements such as temperature or weight over time

D. Spatial coordinates on geographic map projections

Question for HD-081

In the R programming language (specifically within the tidyverse ecosystem), what package or core grammar is widely used for data manipulation tasks such as filtering, selecting, and grouping?

A. numpy

B. ggplot2

C. matplotlib

D. dplyr

Question for HD-083

In modern multi-language analytics environments, what is a primary benefit of supporting multiple languages (such as SAS, Python, and R) within a unified platform?

A. Eliminating the need for data security protocols

B. Allowing analysts to leverage their preferred programming language and best-of-breed open-source libraries within a single governed workspace

C. Restricting execution strictly to batch command-line scripts

D. Forcing all programmers to rewrite legacy SAS code into C++

Open Source Development and Tools Section

Question for OS-027

How does PROC PYTHON in SAS Viya typically facilitate data exchange between the Python environment and SAS?

A. By converting SAS code into Java applets automatically

B. By encrypting SAS logs into binary XML files

C. By allowing Python code to execute within SAS and transfer Pandas DataFrames directly into SAS datasets

D. By deleting Python runtimes after every data step

Question for OS-031

When evaluating open-source software for enterprise applications, what does the term "provenance" primarily refer to?

A. Measuring how fast the software executes on multi-core processors

B. Calculating the storage disk space required for installation

C. Determining the graphical resolution of output reports

D. Verifying the origin, history, authenticity, and supply chain integrity of the software components

Question for OS-041

In R data visualization, what is the primary purpose of the popular ggplot2 package?

A. Implementing the Grammar of Graphics to build flexible, layered data visualizations and plots

B. Compiling SAS macro programs

C. Executing SQL queries against relational databases

D. Managing operating system file directories

Question for OS-048

In cybersecurity vulnerability management, what is a key metric for determining whether an organization is making progress in remediation?

A. The total physical disk space occupied by security scan reports

B. Net change in vulnerability backlog (comparing newly discovered vulnerabilities against those closed or remediated over time)

C. The average length of time required to compile a SAS macro

D. The number of color themes used in executive dashboards

Question for OS-073

In causal inference and statistical modeling, why can time-series publication delays or timestamp jitter lead to incorrect root-cause diagnoses?
A. By converting numeric variables into character strings automatically

B. By disabling ODS HTML generation

C. By increasing the physical memory allocation of SAS datasets

D. By reversing the apparent temporal order of events, causing algorithms to misidentify effects as causes

Question for OS-076

What is DuckDB primarily designed to serve as in modern data analytics environments?
A. A secure operating system kernel for mainframe servers

B. A replacement for the SAS macro compiler

C. An in-process, high-performance analytical SQL database management system optimized for fast data processing

D. A graphic design tool for creating ODS templates

Question for OS-082

What is an Integrated Development Environment (IDE) like Positron or RStudio primarily designed to provide for programmers?

A. A comprehensive interface containing code editors, consoles, debugging tools, and workspace management features

B. A secure database engine for clinical trial regulatory submissions

C. A dedicated hardware server for cloud storage backups

D. A formatting tool for generating Word documents from SAS

Question for OS-085

In collaborative data science projects, what is the primary limitation of storing large datasets or binary model files directly inside standard Git repositories?

A. Git restricts access to users with administrative privileges only

B. Git is optimized for tracking text-based source code changes and performs poorly when storing and diffing large binary files

C. Git automatically encrypts datasets into unreadable formats

D. Git requires an active SAS Viya server license to function

Question for OS-093

What is the primary purpose of AI-assisted ARS metadata in the "From SAP to TLF" workflow?

A. To replace the Statistical Analysis Plan with fully auto-generated text

B. To format Tables, Listings, and Figures for journal publication

C. To establish end-to-end traceability from the Statistical Analysis Plan through to the Tables, Listings, and Figures

D. To validate the statistical methods chosen for the analysis

Question for OS-103

What is a major advantage of modern multi-language analytics ecosystems that integrate SAS, Python, and R?

A. Programmers are forced to abandon SAS code entirely in favor of open-source scripts

B. Analysts can utilize specialized packages from each language while maintaining governance and high-performance execution on a unified platform

C. Execution speeds of local desktops are increased without needing cloud servers

D. All datasets are automatically converted into compressed PDF documents

Question for OS-104

When migrating enterprise analytics projects from legacy platforms to modern cloud environments, what is the recommended initial phase in a successful migration blueprint?
A. Deleting all historical code assets and starting from scratch

B. Converting all databases into unindexed text files immediately

C. Restricting access to administrators only

D. Comprehensive assessment, environment preparation, and code compatibility inventory analysis

Question for OS-109

What is the primary benefit of embedding open-source code inside proprietary analytics procedures (such as PROC PYTHON or PROC R) during software migration?
A. It automatically converts all SAS datasets into encrypted database tables

B. It eliminates the need for any software license renewals

C. It enables incremental modernization by allowing programmers to leverage open-source libraries without rewriting entire legacy codebases from scratch

D. It increases the physical storage capacity of local hard drives

Question for OS-110

When interacting with web APIs that utilize asynchronous job submissions (where requests take time to process before files are ready), what typical workflow pattern is required?
A. Downloading all database records instantly in a single synchronous packet

B. Deleting the API endpoint URL after every connection attempt

C. Compiling raw SAS macros into binary libraries

D. Submitting a request, periodically checking job status or polling endpoints, and retrieving the output files once complete

Pharma and Healthcare Section

Question for PH-019

Which of these continents had the most COVID-19 deaths?

A. Europe

B. Africa

C. North America

D. South America

Question for PH-035

Within CDISC SDTM architecture for clinical trials, what is the primary function of the RELREC (Related Records) domain?

A. To store adverse event severity grades in numeric format

B. To link related records across different domains (such as connecting tumor identification records to tumor measurements and disease response)

C. To compile SAS macro programs into executable packages

D. To generate ODS PDF tables for regulatory submissions

Question for PH-038

In survival analysis using SAS/STAT, what is the primary methodological difference between PROC LIFETEST and PROC PHREG?

A. PROC LIFETEST requires raw SQL databases, while PROC PHREG only processes flat text files

B. PROC LIFETEST computes non-parametric survival curves (such as Kaplan-Meier estimates), whereas PROC PHREG performs semi-parametric Cox proportional hazards regression

C. PROC LIFETEST is restricted to logistic regression, while PROC PHREG handles ANOVA models

D. PROC LIFETEST generates graphical maps, while PROC PHREG compiles macro variables

Question for PH-047

When analyzing longitudinal or repeated-measures data in SAS/STAT where observations within subjects are correlated, why is a mixed model (such as PROC MIXED) preferred over standard linear regression?

A. It automatically deletes missing values without user intervention

B. It assumes all observations across time are completely independent

C. It properly accounts for within-subject correlation and random effects, preventing biased standard error estimates

D. It converts continuous variables into character strings

Question for PH-052

In exploratory data analysis (EDA) of complex healthcare datasets, what is a primary benefit of using interactive data visualization software (such as SAS Visual Analytics)?

A. Allowing analysts to dynamically slice, dice, filter, and uncover multi-variable patterns and relationships that static tables might obscure

B. Compiling raw SAS macro code into binary executable files

C. Deleting duplicate patient records from database tables

D. Automatically generating regulatory submission datasets (SDTM)

Question for PH-089

What is a very helpful advantage of ODS HTML5 when using PNG images?

A. Using OPTIONS(BITMAP_MODE='INLINE') embeds any image files inside the HTML file, which assures relocatability, and the ability to email an image-containing HTML file without having to also attach any image file(s) that the web page is to display. This is needed if your ODS GRAPHICS statement specifies for OUTPUTFMT= any image format other than SVG, which is the default, and is automatically embedded.

B. Support for advanced CSS capabilities

C. Better Accessibility Features (Section 508)

D. Default image type is embedded SVG (Scalable Vector Graphics)

Question for PH-096

In restricted healthcare data environments (such as the CMS Virtual Research Data Center), what is the purpose of implementing "Low Volume Limits" or cell suppression rules in reporting?

A. To accelerate the compilation speed of SAS macro programs

B. To protect patient confidentiality and prevent the re-identification of individuals in small cell counts prior to data export approval

C. To convert numeric variables into character strings

D. To increase the storage capacity of local hard drives

Question for PH-107

When interacting with RESTful APIs in SAS, what is the primary role of PROC HTTP combined with the JSON libname engine?

A. To compile SAS code into binary machine instructions

B. To send HTTP requests, interact with web services, and parse hierarchical JSON response data directly into tabular SAS datasets

C. To manage local operating system file permissions

D. To generate static PDF reports for offline printing

Answer Sheet

AI, Statistics and Analytic methods

Talk ID	Answer	Correct?
AS-008	____	☐
AS-029	____	☐
AS-034	____	☐
AS-059	____	☐
AS-067	____	☐
AS-068	____	☐
AS-070	____	☐
AS-075	____	☐
AS-086	____	☐
AS-087	____	☐
AS-092	____	☐
AS-099	____	☐
AS-108	____	☐

Advanced Programming

Talk ID	Answer	Correct?
AP-009	____	☐
AP-016	____	☐
AP-037	____	☐
AP-039	____	☐
AP-044	____	☐
AP-046	____	☐
AP-061	____	☐
AP-062	____	☐
AP-072	____	☐
AP-077	____	☐
AP-084	____	☐
AP-095	____	☐
AP-097	____	☐
AP-100	____	☐

Basic and Intermediate SAS Coding

Talk ID	Answer	Correct?
BI-007	____	☐
BI-043	____	☐
BI-050	____	☐
BI-051	____	☐
BI-079	____	☐
BI-080	____	☐
BI-094	____	☐

Data Visualization and Reporting

Talk ID	Answer	Correct?
DV-005	____	☐
DV-010	____	☐
DV-011	____	☐
DV-021	____	☐
DV-036	____	☐
DV-040	____	☐
DV-045	____	☐
DV-049	____	☐
DV-071	____	☐
DV-078	____	☐
DV-090	____	☐
DV-091	____	☐
DV-102	____	☐
DV-106	____	☐

E-Posters

Talk ID	Answer	Correct?
EP-006	____	☐
EP-033	____	☐
EP-060	____	☐
EP-098	____	☐
EP-105	____	☐

Answer Sheet – continued

Hands On-Workshops and Live Demos

Talk ID	Answer	Correct?
HD-003	____	☐
HD-012	____	☐
HD-013	____	☐
HD-018	____	☐
HD-030	____	☐
HD-042	____	☐
HD-057	____	☐
HD-069	____	☐
HD-081	____	☐
HD-083	____	☐

Open Source Development and Tools

Talk ID	Answer	Correct?
OS-027	____	☐
OS-031	____	☐
OS-041	____	☐
OS-048	____	☐
OS-073	____	☐
OS-076	____	☐
OS-082	____	☐
OS-085	____	☐
OS-093	____	☐
OS-103	____	☐
OS-104	____	☐
OS-109	____	☐
OS-110	____	☐

Pharma and Healthcare

Talk ID	Answer	Correct?
PH-019	____	☐
PH-035	____	☐
PH-038	____	☐
PH-047	____	☐
PH-052	____	☐
PH-089	____	☐
PH-096	____	☐
PH-107	____	☐

Answer Key

AI, Statistics and Analytic Methods Section

AS-008. B

AS-029. C

AS-034. B

AS-058. A

AS-059. C

AS-067. A

AS-068. B

AS-070. B

AS-075. C

AS-086. A

AS-087. A

AS-092. B

AS-099. D

AS-108. C

Advanced Programming Section

AP-009. A

AP-016. D

AP-037. B

AP-039. D

AP-044. C

AP-046. A

AP-061. A

AP-062. B

AP-072. D

AP-077. C

AP-084. A

AP-095. A

AP-097. B

AP-100. D

Basic and Intermediate SAS Coding Section

BI-007. C

BI-043. A

BI-050. A

BI-051. B

BI-079. D

BI-080. C

BI-094. A

Data Visualization and Reporting Section

DV-005. A

DV-010. B

DV-011. B

DV-021. C

DV-036. A

DV-040. D

DV-045. B

DV-049. B

DV-071. C

DV-078. A

DV-090. A

DV-091. B

DV-102. B

DV-106. C

E-Posters Section

EP-006. A

EP-033. A

EP-060. B

EP-098. B

EP-105. D

Hands On-Workshops and Live Demos Section

HD-003. A

HD-012. D

HD-103. B

HD-018. B

HD-030. C

HD-042. D

HD-057. D

HD-069. A

HD-081. D

HD-083. B

Open Source Development and Tools Section

OS-027. C

OS-031. D

OS-041. A

OS-048. B

OS-073. D

OS-076. C

OS-082. A

OS-085. B

OS-093. C

OS-103. B

OS-104. D

OS-109. C

OS-110. D

Pharma and Healthcare Section

PH-019. A

PH-035. B

PH-038. B

PH-047. C

PH-052. A

PH-089. A

PH-096. B

PH-107. B

Go back to:
Instructions: