

SAS ModelOps Exam

Define the ModelOps Framework (18 – 22%)

Emphasis on governance and stakeholders

- Determine relevant stakeholders based on desired business outcome
- How will collaboration be achieved
- What are standard channels of communication

Determine the business process workflow

- Outline feedback loops and decision validation
- Articulate handoffs and individual roles/responsibilities
 - Establish an approval process
 - Create a peer review process
 - Validate assumptions
 - Review for potential bias
 - Test against hold out data
 - Adherence to compliance and standards
 - Confirm the process is documented
 - Create a business review process
 - Adherence to compliance and standards
 - Verify consumption method
 - Make a Go/No-Go decision
- Define audit and tracking needs
- Automated vs. Manual tasks
- Batch vs. OnDemand vs. Streaming
- Identify third party integration points
 - CI/CD
 - Model development tools
 - Git
 - Mobile Apps

Develop workflow template(s) to execute the process

- Model Type
 - Supervised
 - Unsupervised
- Scoring Environments
 - Cloud
 - On-prem
 - Containers
 - In-database
 - Edge

Develop Model Proposal (23 – 28%)

Define the business objective

- Define the business objective
 - Explicitly define the target variable
 - Assess business impact
 - Identify potential consumption methods
 - Verify alignment with corporate strategy and policies

Associated assets to include

- Cost/benefit analysis
- Optimal business value
- Time to return on investment
- Level of risk
- Caveats/Assumptions
- Finalize consumption method

Evaluation against alternative resource allocation

Establish preferred deployment method

Establish monitoring assessment metrics

- Business outcome metrics
- Optimal model accuracy fit statistics
- Model monitoring frequency and evaluation criteria
- Operational performance metrics

Model Development and Management (23 – 28%)

New or Re-build Model Development

- Pre-processing – data extracts and data preparation
- Model training
- Post-processing
- Integration with third party software

Model tournament

- Evaluate and compare multiple candidate models
 - Utilize fit statistics presented in Business Proposal
 - Consider balance of fit vs. model interpretability
 - Alignment to corporate ethics and data privacy standards

- Select a champion model

Execute peer review

Execute business review

- Exporting score code
- Registering a model
- Publish a model

Model registration

- Metadata
 - Input/output variables
 - Properties
- Artifacts
 - Score code
 - Pre/post processing code
 - Associated external files and documentation

Establish the monitoring process

- Build data extracts for input data
- Create metrics to monitor
 - Model metrics
 - Business metrics
 - System metrics
- Setup thresholds and alerts
- Develop monitoring reports
- Document the process and parameters

Prepare a model for use in production

Model Deployment (18 – 22%)

Develop the data ingestion pipeline

- Confirm naming conventions/standards used
- Review adherence to architecture standards
- Process request for additional data source (if needed)
- Build data extract for monitoring

Define production jobs

- Create consumption application(s) (on-demand/streaming)
- Integrate with decisioning process
- Setup scoring, includes pre-/post-processing
- Setup performance data creation
- Setup performance monitoring reports
 - Model accuracy
 - Business outcome
 - Embed alerts
- Develop follow-up actions
 - Model updates based on performance monitoring
 - Business decisions

IT compliance check

- Validate regulatory compliance
- Cross-check against standards/policy

Pre-production Testing

- Unit testing
- Regression testing
- Performance testing

Production (9 – 12%)

Execute preprocessing

Execute scoring/decision

Execute post-processing

Execute business actions associated with score/decision

Execute performance monitoring

- Evaluation
 - Diagnose data drift
 - Assess model accuracy
 - Business outcomes
 - Operational impact
- Alerts based on thresholds
- Model update (Recalibrate/Retrain/Rebuild/Retire)

Note: All 24 main objectives will be tested on every exam. The expanded objectives are provided for additional explanation and define the entire domain that could be tested.