Snowflake SnowPro Core Certification Guide COF-C02

Hands-on exam preparation with practice questions

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Dedicated to

My beloved parents,
Mr. Kannaiyan *and* ***Mrs. Amsavalli****, and my loving family. I extend my sincere gratitude to my life partner* ***Jayashree****, adorable kids* ***Arnav*** *and* ***Aadith****, my dear sisters, and all my friends for their unwavering support throughout this incredible journey!*

About the Author

Balamurugan Kannaiyan is a highly accomplished Data Management and Cloud expert with over 18+ years of industry experience. With a distinguished track record, he leads the Data Engineering team, leveraging Snowflake's cutting-edge capabilities to build high-performance data applications. Bala brings extensive experience from prior roles within the Public Sector and Fortune 500 companies, where he excelled in designing scalable, cloud-distributed systems.

A graduate of the prestigious ANNA University, Bala holds a Bachelor of Engineering degree and numerous certifications and accreditations in cloud technologies and data management. As a Snowflake Squad Member, he actively participates in user group forums across the globe, sharing his expertise and insights with the community. He is passionate about travel, visiting new places, and gardening.

About the Reviewer

Pooja Kelgaonkar is a seasoned professional in the realm of data and a Snowflake data superhero for the years 2023 and 2024. With an impressive 18 years of industry experience exclusively dedicated to the data domain, Pooja has honed her expertise to become a trusted authority in Snowflake and data platform designs.

Currently serving as a Data Architect at Rackspace Technology, Pooja is stationed in the vibrant city of Toronto, Canada. Her role entails crafting intricate data architectures that drive innovation and efficiency for her clients. Pooja's profound understanding of Snowflake empowers her to architect robust solutions tailored to meet the diverse needs of businesses in the digital age.

Beyond her technical prowess, Pooja is recognized for her strategic mindset and ability to translate complex data challenges into actionable insights. Her dedication to staying at the forefront of emerging technologies ensures that she remains a trailblazer in the ever-evolving landscape of data management.

As a Snowflake data superhero, Pooja continues to inspire her peers and make significant contributions to the advancement of data-driven initiatives, cementing her legacy as a leader in the field.

Acknowledgement

First and foremost, I want to thank my parents and family from the bottom of my heart for their unwavering support and encouragement throughout the whole process of writing this book. I am so lucky to have you in my life.

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I am so grateful for my amazing colleagues in the Snowflake Data Superheroes and Squad. Their inspiration and support have been instrumental in my decision to share my knowledge and expertise with the broader community. I am honored to be part of this amazing group of experts who love what they do to help other data professionals.

Finally, I extend my sincere appreciation to the readers who have shown interest in this book. Your enthusiasm and support have been a driving force behind this project.

Preface

Snowflake is a cutting-edge, modern cloud data platform that is rapidly reshaping the landscape of data management and analytics. Organizations across industries increasingly adopt Snowflake to leverage its features to unlock the full potential of their data. This created a huge demand for skilled Snowflake professionals in the tech industry mastering Snowflake and SnowPro Certified. This book will be a comprehensive guide to help achieve the goal of everyone's SnowPro dream.

This book is for current and aspiring emerging Data professionals, Data/Solution Architects, Data Engineers, Database administrators, Data Analysts, Data scientists, and anyone who wants to explore and learn about the modern data cloud platform. This is an essential resource for any data professional seeking to master Snowflake and SnowPro Certified.

This book is divided into **15 chapters**. In this book, the reader will learn various topics, from Snowflake's fundamentals to advanced key concepts outlined in the SnowPro Certification. This comprehensive guide offers a detailed exploration of the Snowflake platform, empowering readers with the knowledge and skills required to design, implement, and manage robust cloud data solutions. Whether you are seeking to pass the SnowPro certification exam or enhance your expertise in a rewarding career, this book serves as an indispensable asset for your professional development.

Empower your career with this definitive guide to mastering Snowflake and become a SnowPro Certified to take advantage of the platform's fast-paced opportunities. In this book, you will learn the following:

Chapter 1: SnowPro Core Certification - In this chapter, we will provide an overview of SnowPro Core Certification, its prerequisites, and the target audience who will be the direct beneficiaries after completing this certification. We also learn about the list of overall domains, and particular domain topics to prepare and study for the SnowPro certification exam. In addition, we also learn how to register for exams, tips, and recommended resources to prepare and pass the exam.

Chapter 2: The Cloud Data Platform - In this chapter, we will learn about the Snowflake cloud data platform, Architecture, and technical details of the individual architecture components of the Service, Compute, and Storage layers. We also learn about the cloud providers, various editions, pricing details, Snowflake releases, and how Snowflake is different from legacy data warehousing solutions.

Chapter 3: Snowflake Cloud Data Platform Features - In this chapter, we will learn about the unique key features specific to Snowflake such as elastic storage, computing, and additional components within the data cloud ecosystems. We also learn about the impact and benefit of each Snowflake's key features.

Chapter 4: Snowflake Tools and User Interfaces - In this chapter, we will learn about how to get started with Snowflake, and step-by-step instructions to sign up Snowflake free trial account sign-up process. We also learned about the Snowflake user interfaces, Snowsight, Snowpark, and other technical details about various drivers and connectors available to connect Snowflake.

Chapter 5: Snowflake Catalogs and Objects - In this chapter, we will learn about the Snowflake Catalogs and objects such as databases, schemas, tables, views, and various data types available within Snowflake. In addition, we will learn more details about various other objects in Snowflake like Stored Procedures, User Defined Functions, Snowpipe, Streams, Tasks, Shares, Sequences, etc., to simplify and automate the data ingestion process.

Chapter 6: Snowflake Account Access - In this chapter, we will learn about the Snowflake Security principles, how to set up the Snowflake account access, and various network security policies to secure the account from unauthorized access. In addition, we will learn the details about the single sign-on (SSO), Multi-factor Authentication (MFA), and Federated authentication of Snowflake.

Chapter 7: Snowflake Security - In this chapter, we will learn about various Snowflake access control techniques like roles, and their hierarchy, privilege management, data governance tools, and so on. In addition, we will also learn the power of Snowflake's various data governance capabilities and how to secure the data.

Chapter 8: Snowflake Virtual Warehouse and Warehouse Management - This chapter aims to provide comprehensive information about Snowflake virtual warehouses, various characteristics, and configurations around the warehouse, scaling policy, data cache, how to manage and monitor the warehouses, and the credit usage and billing, etc. that helps to manage and work with the warehouse.

Chapter 9: Snowflake Performance Management - In this chapter, we will learn about various performance characteristics of Snowflake including the Query profile, Query history, characteristics of Query history, how to analyze and improve the query performance using various commands and techniques, etc.

Chapter 10: Snowflake Data Loading and Unloading - In this chapter, we will learn about essential aspects of Snowflake data movement, other technical components, and fundamental concepts like stages, file formats, file size considerations, and various methods and commands involved in this data movement process.

Chapter 11: Snowflake Data Transformations - In this chapter, readers will gain knowledge on various available data types in Snowflake, how to work with structured, semi-structured, and unstructured data, and other technical functionalities using UDF and stored procedures.

Chapter 12: Snowflake Data Protection - In this chapter, we will learn about how the data is secured and protected in Snowflake using various data protection features available in Snowflake such as Time Travel, Fail-safe, data encryption, cloning, replications, and further technical details.

Chapter 13: Snowflake Data Sharing - In this chapter, we will learn about the Snowflake Data Marketplace, Account Types, different data-sharing technologies, features, benefits, and how it works in real-time implementations.

Chapter 14: Snowflake Latest Additions - Snowflake keeps introducing new features to meet the industry demands. In this chapter, we will learn about the latest additions, such as Snowpark, Dynamic, Iceberg tables, and the Snowflake Cortex. We will explore how these innovations are continuously evolving to empower the Snowflake community and unlock the full potential of the platform for data management and analytics.

Chapter 15: Snowflake Knowledge Test - In this chapter, we have four sets of model questions to help the readers practice what they expect in the SnowPro Exam. Each model test consists of 25 questions to evaluate learner knowledge across different domains.

Code Bundle and Coloured Images

Please follow the link to download the
Code Bundle and the ***Coloured Images*** of the book:

https://rebrand.ly/ac420e

The code bundle for the book is also hosted on GitHub at
https://github.com/bpbpublications/Snowflake-SnowPro-Core-Certification-Guide-COF-C02.
In case there's an update to the code, it will be updated on the existing GitHub repository.

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Chapter 1
SnowPro Core Certification

Introduction

In this chapter, we will learn about the overview of SnowPro Core Certification, its prerequisites, and the target audience who will be the direct beneficiary after completing this certification. We also learn about the list of overall domains, and particular domain topics to prepare and study for the SnowPro certification exam. In addition, we will learn tips and recommended training to prepare and pass the exam.

Structure

The following are the topics to be covered:

- Certification overview
- Target audience
- Subject area breakdown
- SnowPro core domains and objectives
- Tips to prepare and pass the exam

Objectives

This chapter aims to provide overall information about the Snowflake SnowPro Core Certification and all the necessary technical details to prepare and pass the exam.

Certification overview

The SnowPro Core Certification became the most demanded certification across industries based on the latest trend. This certification demonstrates a person's knowledge and core knowledge to implement and migrate to Snowflake. This certification validates a candidate's understanding of Snowflake as a Data Cloud and how Snowflake can be used to drive business objectives. The SnowPro Core certification is a mandatory prerequisite for all advanced SnowPro Certifications and SnowPro Recertification.

This certification will test the ability to:

- Load and transform data in Snowflake
- Scale virtual warehouses for performance and concurrency
- Query concepts, DDL, and DML operations
- Work with semi-structured and unstructured data
- Utilize Snowflake's continuous data protection (cloning/time travel)
- Utilize data sharing
- Manage and monitor Snowflake accounts

Target audience

Anyone who wants to explore, learn about the modern data cloud and take advantage of the platform and fast-paced opportunities. We recommend that individuals with a minimum of six months of Snowflake experience and familiarity with basic SQL knowledge before attempting this exam:

- Solution architects
- Data engineers
- Data scientists
- Data analysts
- Snowflake account administrators
- Database administrators
- Application developers

Subject area breakdown

Snowflake continuously evolves as new features and functionalities are routinely developed to meet industry demands. The SnowPro Core exam (COF-C01) became available to the Snowflake community users in September 2019. A new version (COF-C02) of the exam was released in September 2022 with revisions made to the exam contents for modernization purposes.

If you are already SnowPro Core certified, please note that you will not be required to take the new version of the exam to maintain your badge or certification status. However, you will follow the new version of the exam for recertification two years after you originally passed the exam. The exam formats for both first and recertification remain the same. Refer to the following details for additional reference:

	SnowPro Core	Recertification - SnowPro Core
Prerequisites	None	SnowPro Core Certification
Exam Fees	USD 175	USD 88
Number of Questions	100	60
Question Types	Multiple Select/Choice True or False	Multiple Select/Choice True or False
Time Limit	115 Minutes	85 Minutes
Passing Score **(Scaled Scoring from 0-1000)**	750	750
Exam Delivery Options	Online Proctoring & Onsite Testing Centers	Online Proctoring & Onsite Testing Centers
Languages	English Japanese	English Japanese (Release date to be announced)

Figure 1.1: *SnowPro Core - Certification Vs Recertification*

Overall, the initial and newer versions (revised in September 2022) of the SnowPro exam domains remain the same, and revisions are made to exam contents for modernization purposes. A few of the task objectives have been eliminated from the updated content outline as they covered topics that were either already sufficiently covered in other areas of the blueprint or are no longer relevant.

Please refer to the following information for what changes to expect in the revised version of the SnowPro Exam. The alignment and weightings for the main content domains from both exam blueprints are listed for comparison purposes below:

COF-CO1 Domain (SnowPro Prior Exam)	Estimated % Range
Snowflake Overview & Architecture	25 – 30 %
Account and Security	10 – 15 %
Performance Management	05 – 10 %
Data Movement	11 – 20 %
Virtual Warehouses	15 – 20 %
Storage and Protection	10 – 15 %

COF-CO2 Domains (SnowPro Revised Exam)	Estimated % Range
Snowflake Cloud Data Platform Features and Architecture	20 – 25 %
Account Access and Security	20 – 25 %
Performance Concepts	10 – 15 %
Data Loading and Unloading	5 – 10 %
Data Transformations	20 – 25 %
Data Protection and Data Sharing	5 – 10 %

Figure 1.2: *SnowPro Core – prior vs latest version: list of domains and estimated questions range*

SnowProcore domains and objectives

This exam outline includes test domains, weightings, and objectives. Please refer to the contents below for the topics required to study for the individual domains:

- **Domain: Snowflake cloud data platform features and architecture**
  - Outline key features of the Snowflake Cloud Data Platform
    - Snowflake's key architecture layers
    - Elastic Compute
    - Elastic Storage
    - Cloud partner categories
    - The Data Cloud / Data Exchange / Partner Network
  - Outline key Snowflake tools and user interfaces
    - Snowflake user interfaces (Web UI)
    - Classic vs. Snowsight
    - Snowflake drivers
    - Snowflake connectors
    - Snowpark
    - SQL scripting
  - Outline Snowflake's catalogs and objects
    - Snowflake databases
    - Snowflake schemas
    - Data types

        - Tables and table types
        - Views and view types
        - **User defined functions (UDFs)**
        - **User defined table functions (UDTFs)**
        - **Stored procedures (SPs)**
        - Pipes
        - Streams and tasks
        - Shares
        - Sequences
    - Outline Snowflake Storage Structure
        - Column metadata clustering
        - Micro partition
        - Storage monitoring
        - Search optimization
- **Domain: Account access & security**
    - Outline Security Concepts
        - **Single Sign-On (SSO)**
        - **Multi-Factor Authentication (MFA)**
        - Network policies and security
        - Federated authentication
    - Define the roles and entities used in Snowflake
        - Explain roles hierarchy and privilege offerings
        - Define how privileges are granted and revoked
    - Snowflake - Data governance capabilities
        - Snowflake account
        - Organization and hierarchy
        - Snowflake database
        - Information schemas
        - Snowflake Secure views
        - Access history and read support
- **Domain: Snowflake performance concepts**
    - Describe the use of the query profile

        - Use of the data cache
        - Query plans
        - Data spilling
        - Micro-partition and pruning
        - Query history
    - Describe Virtual Warehouses (WH) and configurations
        - Single vs. multi cluster
        - Warehouse size
        - Warehouse setting
        - Warehouse access
    - Virtual warehouse performance tools
        - Monitor warehouse loads
        - Scale up vs. scaling out
        - Query performance
        - Resource monitoring
    - Optimize query performance
        - Use of specific **`SELECT`** commands
        - Materialized views
- **Domain: Data loading and unloading**
    - Define best practices and concepts that should be considered when loading data
        - Stage and stage types
        - File formats
        - File size
        - Folder structures
        - Ad hoc/bulk loading using the Snowflake UI
    - Outline different commands used to load data and when they should be used
        - Copy into
        - Create pipe
        - Get
        - Put
        - Insert/Insert overwrite