Stat 8678 - SAS Programming & Data Analysis

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Preface

Description

This course covers programming using the SAS statistical software package, and it provides an introduction to data analysis stressing the implementation using SAS.

Topics include two main parts:

1) **SAS Programming**: data management and manipulation, basic procedures, macro programming;
2) **Data Analysis**: descriptive statistical analysis, one- and two-sample inference, basic categorical data analysis, regression analysis, and other selected topics.

Prerequisites

MATH 4544/6544, or equivalent.

Instructor

Chi-Kuang Yeh, I am an Assistant Professor in the Department of Mathematics and Statistics, Georgia State University.

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Office Hour

TBA

Grade Distribution

- TBA

Assignment

☐ TBA

Midterm

☐ TBA

Topics and Corresponding Lectures

Those chapters are based on the lecture notes. This part will be updated frequently.

Topic	Lecture Covered
Introduction to SAS and modules	1–

Recommended Textbooks

- Statistics 480: Introduction to SAS, The Pennsylvania State University.
- SAS Training, SAS Institute.
- SAS Resources, University of California, Los Angeles.

Acknowledgments

Special thanks to Li-Hsiang Lin for providing the base materials given on this website.

Part I

Introduction

1 Introduction to Basic SAS Operation

Learning objective:

1. Familiarize ourselves with SAS windows (editor, log, output)
2. Create a dataset
3. Sorting Data (by 1 or more variables)
4. Obtain summary statistics of variables

1.1 Introduction to SAS

Q: Wha is SAS?

SAS (Statistical Analysis Software) is a prominent tool in the field of Data Analytics, offering a comprehensive suite for data manipulation, mining, management, and retrieval across various sources, coupled with robust statistical analysis capabilities. It excels in a range of functions including data management, statistical analysis, report generation, business modelling, application development, and data warehousing. SAS is user-friendly, featuring a point-and-click interface for those without technical expertise, while also providing deeper functionality through the SAS programming language. This software is instrumental in employing qualitative methods and processes that enhance employee productivity and business profitability.

Within SAS, data extraction and categorization into tables are pivotal for identifying and understanding data trends. This versatile suite supports advanced analytics, business intelligence, predictive analysis, and data management, facilitating effective operation in dynamic and compet- itive business environments. Additionally, SAS's platform-independent nature allows it to operate seamlessly across various operating systems, including Linux, Windows, Mac, and Ubuntu. SAS provides extensive support to programmatically transform and analyze data in the comparison of drag and drop interface of other Business Intelligence tools. It provides very fine control over data manipulation and analysis.

1.2 SAS Installzation

Georgia State University (GSU) has purchased license, so we can access SAS University Edition for free!

To install SAS University Edition, choose either of the options:

Option 1: Download on your personal PC: Free SAS license available to GSU students, faculty, and staff via Technology Services (download required; check system requirements): Download from https://technology.gsu.edu/technology-services/software-equipment/university-licensed-software/ (Need to log-in from your GSU Account)

Get Help for the Installation from https://gsutech.service-now.com/sp

Option 2:

- On Campus Access: SAS can be found on all GSU Library PCs: Floors 1-4 (not available on Library Macs, because there is no Mac version of SAS)
- Graduate Biostatistics Computer Lab (SPH): 6th floor of the Urban Life building (swipe card access required)
- Common MILE Lab whose opening time is
  - Monday & Wednesday: 9 – 18
  - Tuesday & Thursday: 9 – 17
  - Friday: 9 – 15

Option 3: Access via VLab, GSU's Remote Desktop Environment. Download and Connect to Cisco AnyConnect Client to connect to GSU's VPN (secureaccess.gsu.edu). Once connected to the VPN, login to VLab at: https://vlab.gsu.edu/ to access SAS.

Option 4: Access via SAS OnDemand for Academics/SAS Studio. If you do not already have one, create a SAS profile at https://welcome.oda.sas.com/ Then, sign in with credentials and click SAS®Studio to access the web-based SAS environment.

2 Working with SAS Syntax

3 Import and Export Dataset

4 Random Variables

Part II

Statistical Analysis

5 Introduction to Statistical Inference – part I

6 Introduction to Statistical Inference – part II

7 One Sample Nonparametric Test

8 One Sample Proportion Test

9 Writing SAS Macro Program: Using One Sample Variance Test/CI as Example

10 χ^2 Goodness of Fit Test

References