

MANAGE STATISTICAL DATA

UNIT CODE: MATH/OS/AS/CC/05/6/A

UNIT DESCRIPTION

This unit covers the competencies required to carry out statistical data management. It involves data management using excel, R, SPSS and python.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA <i>(Bold and italicised terms are elaborated in the Range)</i>
1. Manage statistical data on excel spreadsheet	1.1 Applied coding and validation of data as per the procedure. 1.2 Applied Multiple-key sorting as per the procedure 1.3 Applied Sorting of data based on custom lists as per the procedure 1.4 Applied creating single- and multi-level subtotals as per the procedure. 1.5 Applied Filtering of data using text, numeric, date etc. as per the data headers 1.6 Applied Filtering of tables using slicers as per the procedures 1.7 Applied use of Advanced Filter as per the data structures 1.8 Applied knowledge of eliminating duplicate data as per the duplicates 1.9 Applied Use of SUMIF and related functions for quick data analysis as per the procedures 1.10 Applied use of Index & Match as per the procedures 1.11 Applied Conditional Formatting as per the data 1.12 Applied knowledge of Filtering & Sorting as per the procedures 1.13 Applied knowledge of Find & Replace as per the procedures

ELEMENT	PERFORMANCE CRITERIA <i>(Bold and italicised terms are elaborated in the Range)</i>
	1.14 Applied use of data analysis tool as per the procedures 1.15 Interpretation of results from data analysis tool is done as per the coefficients
2. Manage statistical data in R	2.1 Installed R Programming Language & R Studio as per the procedure 2.2 Installed Install <i>R Packages</i> as per the procedure 2.3 Created variables in R as per the data 2.4 Performed Arithmetic calculation in R as per the data 2.5 Built data structures in R as per the data 2.6 Used <i>built-in functions</i> in R as per the required operations and function 2.7 Used character functions in R as per the required procedure 2.8 Used <i>Statistical Probability and density Functions</i> in R as per the required data 2.9 Use other related functions in R as per the required output 2.10 Applied Importation of data into R as per the required format 2.11 Applied Sorting of Data in R as per the data 2.12 Merged data in R per the procedure 2.13 Perform Aggregation in R as per the procedures 2.14 Applied Basic Statistics I.e. Mean, variance, median etc. in R as per the procedure 2.15 Generated Static graphics in R i.e. Basic plots, graphic maps etc. as per the procedure 2.16 Applied data analysis in R as per the procedures.
3. Manage statistical data on SPSS	3.1 Created variables in SPSS as per the procedure 3.2 Entered data in SPSS as per the procedure

ELEMENT	PERFORMANCE CRITERIA <i>(Bold and italicised terms are elaborated in the Range)</i>
	3.3 Coded data in SPSS as per the data 3.4 Imported data from other sources to SPSS as per the data format. 3.5 Applied <i>commands in SPSS</i> as per the function 3.6 Merged data in SPSS as per the data headers 3.7 Generated graphs and charts in SPSS as per the data 3.8 Performed various data Transformation in SPSS as per the procedure 3.9 Performed data analysis using SPSS as per the model.
4. Manage statistical data on Python	4.1 Applied <i>Python Basic operations</i> as per the python procedures 4.2 Applied <i>python Functions and Modules</i> as per the procedures 4.3 Performed <i>Mathematical operations</i> in python as per the developers 4.4 Performed <i>Strings operations</i> on Python as per the developer's procedures 4.5 Applied Sequences, Dictionaries, and Sets on python as per the developers' procedures 4.6 Performed python <i>Flow Control functions</i> as per the developers' procedures 4.7 Applied <i>File Processing</i> in python as per the developers' procedures 4.8 Applied Exception Handling on python as per the developer's procedures 4.9 Performed operations on Dates and Times as per the developer's procedures 4.10 Run Python Scripts from the Command Line as per the developer's procedures

RANGE

This section provides work environment and conditions to which the performance Criteria apply. It allows for different work environment and situations that will affect Performance.

Variable	Range
1. Python Basic operations may include but is not limited to:	<ul style="list-style-type: none"> • Literals • Python Comments • Data Types • Variables • Writing a Python Module • print () Function • Naming Arguments • Collecting User Input
2. Python Functions and Modules may include but is not limited to:	<ul style="list-style-type: none"> • Defining Functions • Variable Scope • Global Variables • Function Parameters • Returning Values • Importing Modules
3. Mathematical operations may include but is not limited to:	<ul style="list-style-type: none"> • Arithmetic Operators • Modulus and Floor Division • Assignment Operators • Built-in Math Functions • The math Module • The random Module • Seeding
4. Strings operations may include but is not limited to:	<ul style="list-style-type: none"> • Quotation Marks and Special Characters • String Indexing • Slicing Strings • Concatenation and Repetition • Common String Methods • String Formatting

Variable	Range
	<ul style="list-style-type: none"> • Built-in String Function
5. Flow Control functions may include but is not limited to:	<ul style="list-style-type: none"> • Conditional Statements • The is and is not Operators • Python's Ternary Operator • Loops in Python • The enumerate () Function • Generators • List Comprehensions
6. File Processing may include but is not limited to:	<ul style="list-style-type: none"> • Opening Files • The os and os.path Modules

REQUIRED KNOWLEDGE AND SKILLS

KNOWLEDGE

The individual needs to demonstrate knowledge and understanding of:

- Use of various menus and functions in excel
- Use of various menus and functions in SPSS
- Use of various functions in R
- Use of various functions in python
- Interpretation of outputs in Excel, r and SPSS
- Computer applications

SKILLS

- Communication skills
- ICT skills

EVIDENCE GUIDE

This provides advice on assessment and must be in conjunction with the performance criteria, required knowledge and understanding and range.

<p>1.Critical Aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Demonstrated knowledge of coding of data 1.2 Demonstrated knowledge of data entry 1.3 Demonstrate knowledge of sorting of data 1.4 Demonstrated knowledge eliminating duplicates in applications in excel 1.5 Demonstrated knowledge of filtering of data 1.6 Demonstrated knowledge of manipulating data 1.7 Demonstrated knowledge of generating graphs, charts and tables 1.8 Demonstrated knowledge generating parameter estimates for regression models 1.9 Demonstrated knowledge of generating an ANOVA table 1.10 Demonstrated knowledge generating random numbers 1.11 Demonstrated knowledge running time series and obtaining its components 1.2 Demonstrated knowledge of use of R as a statistical package for data analysis 1.3 Demonstrated knowledge of use of SPSS as a statistical package for data analysis 1.4 Demonstrated knowledge of use of python as a statistical package for data analysis
<p>2.Resource Implications</p>	<p><i>The following resources must be provided:</i></p> <ul style="list-style-type: none"> 2.1 Computer 2.2 Internet 2.3 Datasets 2.4 Books in statistics
<p>3.Methods of Assessment</p>	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Oral questioning 3.2 Practical demonstration 3.3 Observation 3.4 Written texts

4.Context of Assessment	Competency may be assessed individually in the actual workplace or through a simulated work place environment or During Industrial Attachment.
5.Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

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