United States International University-Africa

Education to take you places

SCHOOL OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF DATA SCIENCE AND ANALYTICS

SUMMER 2024 – MID-SEMESTER

COURSE CODE: STA 3050A **UNIT NAME:** TIME SERIES AND FORECASTING

DATE: 20TH JUNE 2024 **TOTAL MARKS**: 30 MARKS

INSTRUCTIONS:

For this exercise:

1. ANSWER ALL QUESTIONS
2. Do all your work in the Rmarkdown (.rmd).
3. Submissions should be in **`.rmd` file**
4. **Discuss your findings for all the questions**
5. **NO SUBMISSIONS SHOULD BE MADE VIA EMAIL**

CASE SCENARIO: TOURIST ANALYSIS IN CAPETOWN

Cape Town, a scenic destination celebrated for its breathtaking landscapes and rich cultural heritage, attracts a diverse group of tourists throughout the year. Its charming old town, scenic hiking trails, vibrant local markets, and tranquil beaches offer visitors a wide array of activities. The attached **hypothetical data** provides insights into the number of tourists visiting Cape Town from 2019 to 2023.

1. Determine the seasonal variation in tourist numbers for each using the ratio-to-moving average approach from 2019 to 2023. (6 Marks)
2. Obtain a clearer view of the underlying trend by eliminating seasonal fluctuations. (6 Marks)
3. Compute the long-term trend in tourist numbers over the specified period by applying the suitable trend analysis to the deseasonalized data. (6 Marks)
4. Obtain the cyclic index to better understand the cyclical variations in tourist numbers that may be influenced by economic cycles or other factors. (6 Marks)
5. Generate graphs of the data to illustrate the seasonal, trend, and cyclic components in the number of tourists visiting Cape Town. (6 Marks)