


EXAM	Type	<input type="checkbox"/> Midterm <input checked="" type="checkbox"/> Final <input type="checkbox"/> Resit <input type="checkbox"/> Make-up <input type="checkbox"/> One / Three Course			ADANA ALPARSLAN TURKES SCIENCE AND TECHNOLOGY UNIVERSITY FACULTY OF ENGINEERING ELECTRICAL AND ELECTRONIC ENGINEERING DEPARTMENT <b>EXAM PAPER</b>		
	Date	24/06/2025	Place	Lab			
	Time	13:15-14:45	Duration	90 min.			
STUDENT	Name				COURSE	Semester	2024-2025 Spring Term
	Student ID					Course Code & Name	EEE356 Data Analytics
	Signature					Lecturer	Asst. Prof. Dr. Kasim ZOR

EXAM RULES	<p>* By signing this document, the student undertakes to comply with the exam rules. Exam papers of students who do not follow the rules, fail to sign, or do not fill in the required fields will be considered invalid, and these students will be deemed to have received a score of 0 (zero) in the exam.</p> <p>* During the exam, <b>all electronic communication devices</b> (mobile phones, smartwatches, etc.) and other electronic devices not permitted by the exam supervisor (<b>mp3 players, all types of computers, calculators, etc.</b>) must be completely turned off. The use of such devices during the exam is <b>strictly prohibited</b>.</p> <p>* In multiple-choice exams, if students make incomplete or incorrect markings on the optical form, mark areas outside the designated coding section, or damage the optical form, their exams will be deemed invalid, and they will receive a score of 0 (zero).</p> <p>* Students who cheat in exams, attempt to cheat, assist others in cheating, have someone else take the exam on their behalf, take an exam on behalf of someone else, disrupt order during the exam, or violate ATÜ exam regulations will be subject to disciplinary action in accordance with the relevant articles of Law No. 2547 on Higher Education, based on the report prepared by the exam supervisor, and will receive a grade of 0 (zero) for the exam.</p>
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Course Learning Outcome No.	1, 2, 3	1, 2, 3	Total Score
Question No.	1	2	
Full Score for the Question	40	60	
Student's Score for the Question			

### EXAM QUESTIONS

- Download the file named as “people-without-electricity-country.csv” in “Number of people without electricity” data set from Kaggle data sets and answer the following questions by using the downloaded file along with emphasising R codes.
  - (20 pts) Plot a graph with red coloured double-sized path geometry that demonstrates the number of people without electricity access in Türkiye versus years between 1990 and 2020 in accordance with the followings: (i) Name of y-axis should be “People without Electricity Access”, (ii) x-axis name should not exist, and (iii) title of the plot should be Türkiye.
  - (10 pts) Find the number of entities in which the number of people without electricity access equals to zero for all years.
  - (10 pts) Find the Top25 countries of the year 2016 from the viewpoint of the number of people without electricity access.
- (60 pts) Download the files named as “london energy.csv” in “London Energy Data” data set and “london weather.csv” in “London Weather Data” data set from Kaggle data sets, use both data sets for day-ahead electrical energy consumption forecasting of households with unique IDs of MAC001881, MAC001923, MAC001938, and MAC002025 by using multiple linear regression (MLR) method, calculate coefficient of determination ( $R^2$ ), mean absolute error (MAE), and mean absolute percentage error (MAPE), and compare the results of each household with others.

Household Unique ID	$R^2$ (%)	MAE (kWh)	MAPE (%)
MAC001881			
MAC001923			
MAC001938			
MAC002025			