University Case Study 2

Introduction

A famous US accreditation body wants to update norms considering tuition fees in their rating.

It seeks to understand what tuition fees depend on. Data concerns a sample of US universities.

Develop a model estimating tuition fees

Variables

Variables	Variable Description	Categories/levels
Name	University name	
Higher.degree	Highest degree offered	Doctor's degree research scholarship Doctor's degree research scholarship and professional practice Doctor's degree other Doctor's degree professional practice Master's degree, Bachelor's degree
Type	Type of university	public, private not-for-profit
Total.applicants	Number of applicants	
Total.eligibles	Number of eligible students	
Total.qualified	Number of admitted students	
Tuition.fees	University tuition fees	
Total.students	Total number of students	

Questions

1. **Check the structure of the variables: are their type correct?**
2. **Recode the variable "Highest degree offered" into 3 a three categories variable (Bachelor, Master, Doctor)**
3. **Create the variable "acceptance rate"**
4. **Study correlation among quantitative variables**
5. **Model the tuition fees using a multiple linear regression model**
    a. **Which predictors do you choose?**
    b. **Is the ANOVA test significant?**
    c. **Which variables are significant in the model? Use the backward method.**
    d. **Can we conclude that tuitions fees increase with the number of applicants?**
    e. **Can we conclude that the lower the acceptance rate, the higher the tuitions fee?**
    f. **Can we conclude that private universities are cheaper ?**
    g. **Evaluate the quality of the model**
    h. **Study the residuals of the selected model**
        i. **Is residuals mean 0?**
        ii. **Are residuals normally distributed?**
        iii. **Are residuals homoskedastic?**
        iv. **Are residuals autocorrelated?**
        v. **For hypotheses not validated, use the adequate remedies.**
    i. **Check for multicollinearity**
    j. **What should be the tuitions fees of universities with the following characteristics :**

Higher.degree.rec	Type	Total.applicants	Total.eligibles	Total.qualified	Total.student
Doctor's degree	Private not-for-profit	5500	500	360	1500