Problem set 5: Dummy variables
Data analysis part, ØKA201

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Excercise 1

Utilize the data set `advertising.gdt`, which you can find on Canvas. Y_i is the number of impressions, and X_i is the expenditure in the models below.

a) Estimate Model 1: $Y_i = \beta_0 + \beta_1 X_i + \beta_2 X_i^2 + u_i$, and interpret the estimated slope coefficient.

b) Estimate Model 2: $Y_i = \beta_0 + \beta_1 X_i + \beta_2 X_i^2 + u_i$.

c) What is the effect of increasing expenditures with one million dollars on impressions if expenditures are 5,0 millions of dollars in Model 2?

d) What is the effect of increasing expenditures with one million dollars on impressions if expenditures are 185 millions of dollars in Model 2?

e) Estimate Model 3: $Y_i = \beta_0 + \beta_1 X_i + \beta_2 X_i^2 + \beta_3 X_i^3 + u_i$.

f) What is the effect of increasing expenditures with one million dollars on impressions if expenditures are 5,0 millions of dollars in Model 3?

g) What is the effect of increasing expenditures with one million dollars on impressions if expenditures are 185 millions of dollars in Model 3?

h) Estimate Model 4: $\ln Y_i = \beta_0 + \beta_1 \ln X_i + u_i$

i) Interpret the estimated slope coefficient in Model 4?

j) Predict the number of impressions if expenditures are 150 million dollars in i) Model 1, ii) Model 2, iii) Model 3 and iv) Model 4.

k) Which of the four models would you prefer to use?