

PS07 WRITTEN SOLUTIONS

1. SDM Exercise 28.2 on candy sales (p.838)

Answer:

- a) $\hat{Time} = 28.4 + (11.37 \cdot 15) + (2.91 \cdot 20) = 257.15$ calories
b) $227 - 257.15 = -30.15$ calories
c) Her candy has fewer calories than might be expected from the model.
2. SDM Exercise 28.4 on movie profits
- Answer:** The manager is incorrectly interpreting the coefficient causally. The model says that longer films had smaller gross incomes (after allowing for Budget and Stars), but it doesn't say that making a movie shorter will increase its gross. In fact, cutting arbitrarily would, for example, probably reduce the *Star* rating.
3. SDM Exercise 28.12 more interpretations

Answer:

- a) Regression predicts mean values, not a precise value.
b) Sounds like a perfect relationship.
c) Changes in one predictor variable are not necessarily associated with change in another predictor variable.
d) This is correct.
4. SDM Exercise 28.14 parts a) and c) on Scottish hill races

Answer:

- a) $\hat{Time} = -10.3723 + 4.042 \text{ Distance} + 0.034227 \text{ Climb}$
- The time of a race increases as either the distance or the climb increases.
- c) For races of a given distance, we expect the mean *Men's Record* time to increase by 0.034 minutes for each additional meter of *Climb*.
5. SDM Exercise 28.20 parts a) and b) on GPA and SAT's

Answer:

- a) $\hat{GPA} = 0.574968 + 0.001394 \text{ SATV} + 0.001978 \text{ SATM}$
b) $\hat{GPA} = 0.574968 + 0.001394 (500) + 0.001978 (550) = 2.3599$