DSS5105 Exercise 2

**Question 1**

b)

The estimated ATE of participating in the carbon offset program is approximately -9.11, indicating participation is associated with a decrease in the stakeholder engagement score by 9.11 units on average.

The p-value is 0.00036, which is significantly lower than 0.05, indicates that we can reject the null hypothesis that ATE is equal to zero. This further indicates that the effect of participating in the carbon offset program is statistically significant. And there is a real difference between the stakeholder engagement scores of companies participating in the carbon offset program and those of non-participating companies.

c)

Unconfoundedness: there are no unobserved variables that simultaneously affect both the treatment assignment and the engagement score.

Linear Model Correctness: assume that the linear regression model we built accurately measures the relationship between the treatment variable and the covariate.

Stable Unit Treatment Value Assumption (SUTVA): treatment applied to one unit does not affect outcomes of other units.

**Question 2**

c)

图形用户界面, 文本, 应用程序, 电子邮件

AI 生成的内容可能不正确。

The above shows the API response to the request curl “http://localhost:5000/predict?w=1&x=20”. The result is approximately 117.16, which indicates that when corporations participated in the carbon offset programme and spent $20000 on sustainability initiatives, the predicted engagement score is 117.16.

Brief explanation:

* app.py:  
  app.py implementsa Flask web API, loads the pre-trained regression model, takes input values (Wi and Xi), and returns a predicted score (Yˆi) in JSON format, allowing users to obtain predictions results.
* Dockerfile:  
  The Dockerfile assigns the Python environment, dependencies, and configurations required to run the Flask application. It ensures that the development environment can be recreated in any cloud-based environment like GitHub Codespaces.
* Containerization:  
  Containerization using Docker encapsulates the application and all its dependencies into a single package. This approach ensures consistency and improves reproducibility and scalability of the application.