Task 3: Vegetation-Environment Analysis (Student C)

Scenario Selection and Justification *From the scenarios in Group 4 (S4.1 to S4.3), select the one you hypothesize to be the most effective for mitigating urban heat compared to the baseline scenario S0. State your choice below and provide a detailed justification.*

Selected Scenario:

Justification:

A. Analysis of Environmental Conditions (T_{air}, MRT, RH, V_{air})

Insert supporting figures (e.g., contour or time-series plots) below. You may insert a composite figure with multiple panels; if so, please label them (a), (b), etc., and describe each panel in your caption. Refer to all figures in your analysis.

Insert figure(s) for Environmental Conditions analysis
(Use a PDF editor to insert your image(s) here)

Figure 3.1:

*Provide a comprehensive analysis of the changes in environmental conditions for both **daytime** and **nighttime**. Explain how the chosen vegetation (hedges or trees) influences each variable through mechanisms like shading, evapotranspiration, and modification of airflow (V_{air}).*

B. Analysis of Surface Fluxes

Insert supporting figures, provide captions, and refer to them in your analysis.

Insert figure(s) for Surface Flux analysis
(Use a PDF editor to insert your image(s) here)

Figure 3.2:

Analyze the significant alteration of the surface energy balance caused by vegetation. Discuss the magnitude of the latent heat flux (Q_E) and explain its diurnal cycle. How does the presence of vegetation reduce the sensible heat flux (Q_H) and ground heat flux (ΔQ_S) compared to the asphalt baseline?

C. Analysis of Thermal Comfort (PET)

Insert supporting figures, provide captions, and refer to them in your analysis.

Insert figure(s) for Thermal Comfort analysis
(Use a PDF editor to insert your image(s) here)

Figure 3.3:

Analyze the impact on PET. Vegetation is often highly effective at improving comfort. Explain the relative contributions of shading (reducing MRT) and evaporative cooling (reducing T_{air} and increasing RH) to the overall improvement in PET. **Importantly, link the calculated PET values to the corresponding thermal sensation and/or heat stress levels (e.g., "heat stress was reduced from 'Extreme Heat Stress' to 'Strong Heat Stress'" or thermal sensation was shifted from 'warm' to 'slightly warm').**