4. During a summer science program at his local community college, Tyler is assigned to conduct an experiment to see if fruit flies (*Drosophilia melanogaster*) can be developed from embryo to mature adult faster by changing the room temperature. The two available lab locations are identical in relevant characteristics such as size, layout, lighting, and humidity, with the only difference being the location temperature. Location A, the location currently used at the community college, remains at a constant temperature of 74 degrees Fahrenheit. Location B, the location under consideration for future experiments, stays at a constant temperature of 77 degrees Fahrenheit. Sixteen uniform plastic vials are used to host the fruit flies in the experiment, with 8 randomly assigned to Location A and the other 8 to Location B. The following table shows the amount of time, to the nearest half day, for the fruit flies to develop from embryo to mature adult fly for each vial in the two locations.

Number of days to develop from embryo to adult

Location A	10	10.5	10.5	10	10	9.5	10	10.5
Location B	9.5	9.5	9	9	10	9	10	9

(a) Is there convincing statistical evidence, at the significance level of $\alpha = 0.05$, that changing to Location B will result in a faster mean development time from embryo to mature adult fruit fly? Complete the appropriate inference procedure to support your answer.

(b) Based on your conclusion from part (a), could a Type II error have been made? Explain.