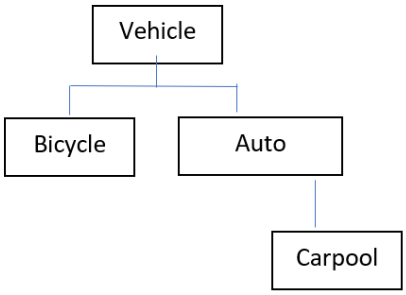
CIS 284 – Exam 3

Develop a Windows Forms or Console app that compares the time and cost of various commuter travel options. Your apps needs a class hierarchy to represent a commuter's three travel options: Bicycle, Auto, or Carpool.



All travel options have a name (*Name*), an average speed (*Speed*) in miles per hour, the number of miles travelled (*Miles*), and the required time in hours (*Hours*). Hours is always `Miles/Speed.` The name of each travel option does not change. It is either *Bicycle*, *Auto*, or *Carpool*.

The auto option assumes all automobiles travel at 65 mph. However, the fuel cost depends on the auto's miles per gallon (*Mpg*). Therefore, the Auto constructor has two parameters, one for miles traveled, and another for the vehicle's miles per gallon. Assuming fuel costs $3.00 per gallon, the fuel cost (*Cost*) may be determined as follows: `Cost = Miles / Mpg * $3.00`

The carpool option costs less per person compared to an auto because the cost of fuel is divided by the number of passengers (*Passengers*). Therefore, the Carpool constructor has an additional parameter for the number of passengers.

The bicycle option is economical but slower. Suppose that a cyclist can bike at a speed equal to 2000 divided by their weight (*Weight*), as follows: `Speed = 2000/Weight.` A bicycle doesn't have a *Cost* property because it uses no fuel. Therefore, the Bicycle constructor has two parameters: the number of miles travelled, and the weight of the cyclist.

Now, create an array (or collection) of Vehicle objects that includes a bicycle, an auto, and a carpool, all traveling 50 miles. The cyclist weights 150 lbs; the auto gets 25 mpg; and the carpool with 5 passengers gets 15 mpg. Use a loop to display the Hours and Cost of each vehicle, as appropriate. You may downcast the vehicle object to reference its Cost property.