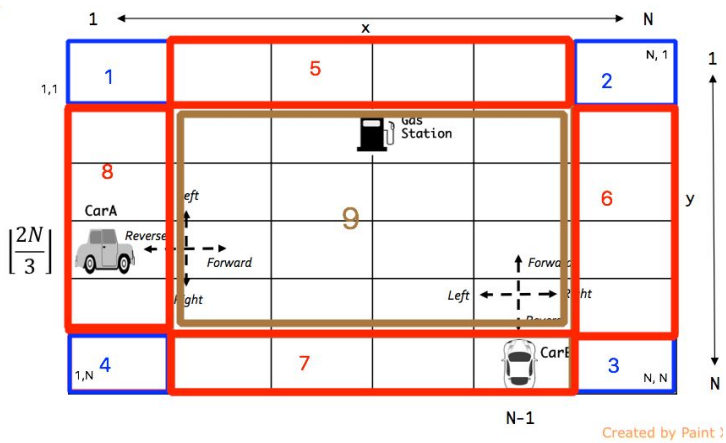
Assignment 2

Assumptions:

- Cars will never go out of map!
- Simulation will never stop even after crashing or reaching petrol pump
- Independent movement of cars are not allowed, i.e. their movements are synchronized with each other.
- Map must be square (Length = width)
- Though the given model can work for more than two cars, but such change will require in slight changes in the model. Hence given model works for only 2 cars.
- Initial position of car and location of gas station is only dependent on N and can not be changed by other factors.
- Areas of map are divided in 9 sections as shown follow:

  - Four corners:
    - 1 (1,1)
    - 2 (N,1)
    - 3 (N,N)
    - 4 (1,N)
  - Four edges:
    - 5 ([2,N-1], 1)
    - 6 (N, [2,N-1])
    - 7 ([2,N-1], N)
    - 8 (1, [2,N-1])
  - Central Area
    - 9 ([2,N-1], [2,N-1])



Insights:

- Two following models have been devised:
- Model 1: When probability of choosing any of the 4 direction is equal
- Model 2: When probability of going straight/backward > prob of going right/left.
- Contrast between probabilities for model1 and model2:
  - Prob of car crash is slightly higher for model 2, the reason behind this is initial position of the cars, since cars are at such position that moving right and left instead of straight will make them highly probable to meet.
  - Prob of reaching gas station is for model 2 is higher for the same reason.

Difficulties:

- Calculating cost at every border cell. I was using state variable for this counter as global variable are immutable. Using state variable for this purpose was increasing the number of states by manyfold. But then I realized the of rewards/cost in prism.
- Deciding the states of the model. Since there are many ways to design a model in prism. It becomes difficult to decide what to choose.