Writeup Part

## Question 1)

1. Since we just need the variables to express whether a person is going on the car or not and since we have six people, we just need 6 people. Since there are two choices for each person, there are assignments in total.
2. a)

b)

c) , which implies

d) which implies

which implies

1. Yes it is satisfiable. One such solution is are true. are false.

## Question 2)

1. See email
2. Since there are twenty variables and each variable can take on at most two possible choices, there are variable assignments
3. Since k is at most twenty, a small number, we can just run the experiment with all possible values of k and determine the best possible k. In cases where k can take on more values, we could use greedy search or another algorithm to find k.

## Question 3)

1. = 10! = 3628800
2. 9 since once we picked the digit, there are 9 other digits that this one can be swapped with.
3. There are 9 neighbors, that is:
   1. (8 9 7 6 5 4 3 2 1 0)
   2. (7 8 9 6 5 4 3 2 1 0)
   3. (6 8 7 9 5 4 3 2 1 0)
   4. (5 8 7 6 9 4 3 2 1 0)
   5. (4 8 7 6 5 9 3 2 1 0)
   6. (3 8 7 6 5 4 9 2 1 0)
   7. (2 8 7 6 5 4 3 9 1 0)
   8. (1 8 7 6 5 4 3 2 9 0)
   9. (0 8 7 6 5 4 3 2 1 9)
4. After you finish making 10 swaps (where 10 is the number of elements), you wrap around to the beginning, so essentially during the iteration, you are swapping at position . Therefore, during the iteration, you will swap at position 1.
5. DONNO