Question 1: Express each of the above-mentioned constraints in FOL and transform into clauses in CNF format. How many clauses in total are there to encode a wedding seating arrangement in terms of <M>, <N>, <E> and <F>?

A: The answer of the first question is given by the TA.

<M> + <M>*<N>*(<N>-1)/2 + 2* <N>* <F> + <N>* <E>

Question 2: Compare the curves that result from running this experiment with both algorithms. Are they the same? Why, or why not?

A: No, they are not the same. The pl-resolution curve is above the walkSAT curve. Because pl-resolution algorithm guarantees to find out the answer if one exits while walkSAT algorithm just tries some assignments(not all) and may miss the answer.

Question 3: What seems to happen to the satisfiability as <f> increases? Give an explanation as to why this might be the case.

A: The satisfiability decreases. When <f> increases, the number of clauses generated will also increase. In order to satisfy more clauses, the satisfiability decreases.

Question 4: How does the result vary with different <max_flips>? Why, or why not?

A: When <max_flips> increases, the satisfiability increases. With a higher <max_flips>, the walkSAT algorithm will try more possible assignments, so the satisfiability may increase.

Question 5: Is the average ratio of clause/symbol in the sentences consistent with that you theoretically derive from the result of Question 1? Why or why not? You need to consider the probability setting <f=2%, e=2%> in this case.

A: <F> = 0.02* <M>*(<M>-1)/2   <E> = 0.02* <M>*(<M>-1)/2

clause/symbol = clauses in total/(<*M*>* <*N*>) is approximately proportional to <*M*> and <*N*>. Yes, it is consistent with the result of Question 1. When <*M*> and <*N*> increase, the average ratio of clause/symbol will also increase.

Question 6: How does average runtime change with regard to the average ratio of clause/symbol in this experiment? Is the curve consistent with that of AIMA Figure 7.19(b)? Why or why not?

A: When the average ratio of clause/symbol increases, the average runtime also increases. Yes, the curve is consistent with that of AIMA Figure 7.19(b). Because all the ratios of clause/symbol in this experiment are less than 4.3(The most difficult problems have a clause/symbol ratio of about 4.3.).