Hello everyone, I’m Liu Yuxi, come from the department of future network. My undergraduate school is Hebei university of technology. My supervisor is Wang Yi.

This week we first talk about how I generate LP problem. I use the vertex cover problem as the problem background. Futhermore, I removed the restriction that x must be binary. Through this way ,the problem change to LP problem. I create two variables in this problem to change the number of variables and constrants. The N is the numbe of variables and w Is the probability that there is an edge between two vertices. Each time, we only need to set this two variables to change the scale of the problem.

The software I use is matlab linprog method. Here is a simple case with four vertices and five edge. The problem we change to follow LP problem. And solve this model we get this answer, it’s a optimal solution.

And for complex problem, this method meet a unsolvable problem. Here we forecast the execution time of linprog method. I found the execution time is linearly related to the number of constraints. There are also some outliers here, like this point, this point represent graph is fully connected.

And here is figure about the execution time with the number of variables. We use when the number of variables is small for fitting. And predict the exection time when we have ten thousand, one hundred thousand and one million. So I think the linprod can not solve the big size LP problem.

And here is some other software recommended by network. I have tried lingo and cplex but still not solve the LP problem with million variables.

And here is some Time complexity of different, I search from Wikipedia. And I found the linprog of matlab is not good at all.

Thank you.