Student’s Name:

Instructor’s Name:

Class Name:

Date when Due:

Constrains

Constraints are powerful and natural means of the reasoning and representation concerning compound issues which affect our lives. For instance, in the creation of the university timetable, most constraints happen to like the math’s lecture theater having a capacity of 100 pupils; no pupil attended two lectures at the same time. Constraint programming provides the means through which the solutions to the problems could be established automatically in two stages. The probable first modeled as the set of the variables of decisions and the constraint set on the variables which the solution needs to satisfy. The decision variable provides the representation of the choice which is required to be made to solve the stated problem. The probable values domain linked with every variable of decision corresponds to the options for the opportunity in the example above one may have two variables of decisions per lecture with one representing the venue and the other one serving the time. The second stage comprises of utilization the constraint solver in establishing solutions to model values assignments to the variable of decision satisfying all the constraints. Constraint programming is the proven technology for the solving of the complex combinatorial decisions or the optimization problems of the kind in most disciplines like banking, industrial design, scheduling, steel and petrochemical industries, and combinatorial mathematics.

Consider a capital budgeting problem with seven projects represented by binary (0 or 1) variables X1, X2, X3, X4, X5, X6, X7.

1. Write a constraint modeling the situation in which only 2 of the projects from 1, 2, 3, and 4 must be selected.

Answer: X1+ X2+ X3+X4 = 2

1. Write a constraint modeling the situation in which at least 2 of the project from 1, 3, 4, and 7 must be selected.

 Answer: X1+X3+ X4+ X7≥ 2

1. Write a constraint modeling the situation project 3 or 6 must be selected, but not both.

Answer: X3 + X6 = 1

1. Write a constraint modeling the situation in which at most 4 projects from the 7 can be selected.

Answer: X1+X2+X3+X4+X5+X6 +X7≤ 4