Practical Course: Management Science

Student sectioning involves a student's assignment to a course (that is, a section of a course) while observing the individual student's course requests, as well as the instructor's restrictions (e.g., two students cannot attend the same class simultaneously).

Consider a problem of assigning students to courses with limited capacity. There are n students, and each student $i \in \{1, \ldots, n\}$ wants to attend a_i courses. Moreover, for each course $j \in \{1, \ldots, m\}$ we know the maximum number of students b_j that may attend it. Finally, every student i also gave a preference c_{ij} for each course j, where smaller c_{ij} -values mean higher preferences. We now want to minimize the sum of all preferences (of student course assignments), satisfying the constraints that every student is assigned to their requested number of courses and that the maximum course capacity is not exceeded.

According to the given case, you should develop a mathematical model which will be called as main model. Then the model will be extended by given independent tasks (2.4 and 2.5) which have two sub-tasks accordingly in your task sheet. You do not have to restate the model but specify the required modifications instead. Explain all changes you make to your model and comment your results.