MATH1058: Problem Sheet 3

Problem 1 (Production planning with storage)**.** *A company has to determine a production and a distribution schedule for a high quality measurement instrument for the next three months. Each month, the company can produce 110 units at a production cost of 300 GBP per piece. Another 60 units can be bought, each month, from a third-party company at a unit cost of 330 GBP. Unsold units are stored, incurring a holding cost of 10 GBP per unit and per month. Due to contractual agreements, the company is bound to ship to its retailers 100, 130, and 150 units of the instrument in each of the three months, respectively.*

Propose a linear (with or without integrality restrictions) programming formulation to find a production and purchasing plan which minimizes the total costs while meeting the monthly demand. You can either write a formulation tailored to the instance of the problem considered here (i.e., one only product, a time horizon of three months, ...), or a more general one which works for any number of months and for any value the parameters may take (this second option is suggested).

Problem 2 (Sorting algorithms)**.** *Sort the following list of integers*

$$a = (5, 3, 7, 1, 6)$$

in nondecreasing order with each of the following algorithms: a) Selection Sort, and b) Insertion Sort.