Assignment: Greedy Algorithms
Deadline: April 15, 2025 @ 10am

Instructions: *Submit a pdf copy of your answers in LMS.*

1. **Given a set of items and knapsack capacity = 60 kg, find the optimal solution, for the fractional knapsack problem by using greedy approach.**

Item	Value	Weight
A	60	10
B	100	20
C	120	30
D	80	24
E	30	6
F	50	10

   a. Show the sorted table by ratio.
   b. Show the table containing the added items (with decreasing capacity and increasing value)
   c. Show the final list of items added in the bag with the total value.

2. **Given the following activity sets:**

A1	1	4
A2	8	12
A3	2	14
A4	5	7
A5	3	9
A6	6	10
A7	5	9
A8	8	11
A9	3	5
A10	0	6

a. Show the sorted table.
b. Find the maximum number of non-overlapping activities you can select.
c. List the set of non-overlapping activities that you can include.

3. **Determine the pairings using the Gale-Shapley Algorithm.**

MEN

Betts	Mia	Kate	Hailey	Cassey
Pajes	Kate	Mia	Cassey	Hailey
Conforto	Mia	Cassey	Kate	Hailey
Smith	Cassey	Mia	Kate	Hailey

WOMEN

Mia	Conforto	Pajes	Betts	Smith
Kate	Betts	Conforto	Smith	Pajes
Hailey	Smith	Conforto	Betts	Pajes
Cassey	Betts	Conforto	Pajes	Smith

4. **Find the minimum number of subsets required in order to cover all areas.**

Camera Location	Area
S1	1,3,4,6,7
S2	4,7,8,12
S3	2,5,9,11,13
S4	1,2,14,15
S5	3,6,10,12,14
S6	8,14,15
S7	1,2,6,11
S8	1,2,4,6,8,12

a. Show your solution by drawing the table including the number of elements not covered at every iteration, for every subset.
b. List the subsets.