**Faculty of Engineering, University of Jaffna,**

**Department of Computer Engineering**

**EC4070: Data Structures and algorithms**

**Lab 08**

**Chapter 07: Greedy Algorithms**

Duration: 3 Hours Lecturer: Ms.Sujanthika M.

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## Instructions

i. Submit the code files and screenshot of the outputs in a zipped folder by naming as 2022EAAA_Lab08(AAA – Your Registration Number)
ii. Submit your zip file before the given deadline.
iii. Any plagiarized work will be given 0 marks.

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### 1. Gas Station problem

You are traveling along a straight road of length D. You start with a full tank of fuel that can hold up to C gallons. The car's fuel efficiency is E miles per gallon, meaning it can travel $C \times E$ miles on a full tank. Along the way, there are gas stations, each located at a specific distance from the start and providing a specific amount of fuel.

Your goal is to calculate the **minimum number of refueling stops** required to reach the destination. If it is not possible to reach the destination, return −1.

#### *Input Format*

1. An integer D, the total distance to the destination (in miles).
2. An integer C, the fuel tank capacity (in gallons).
3. An integer E, the car's fuel efficiency (in miles per gallon).
4. An integer n, the number of gas stations along the way.
5. An array stations[ ] of size n, where each element is a tuple (position,fuel):
    a. position: Distance of the station from the start (in miles).
    b. fuel: Amount of fuel available at the station (in gallons).

### *Output Format*

1. The **minimum number of refueling stops** required to reach the destination.
2. If it is not possible to reach the destination, return -1.

### Sample Input

D = 100

C = 5

E = 5

n = 4

stations = [(25, 2), (50, 3), (75, 4), (90, 1)]

### Sample Output

Minimum Refueling Stops: -1