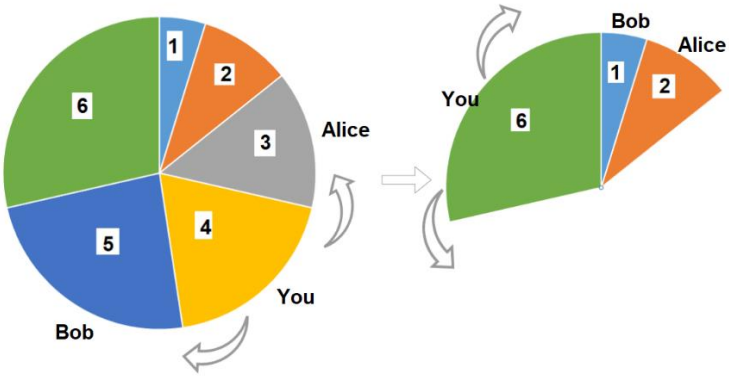
Lab Assessment -2

Design and Analysis of Algorithms:

Time : 60 Min

Write the program to execute the following scenarios:

1. There is a pizza with 3n slices of varying size, you and your friends will take slices of pizza as follows:
    - You will pick any pizza slice.
    - Your friend Alice will pick next slice in anti-clockwise direction of your pick.
    - Your friend Bob will pick next slice in clockwise direction of your pick.
    - Repeat until there are no more slices of pizzas.
    - Sizes of Pizza slices is represented by circular array slices in clockwise direction.
    - Return the maximum possible sum of slice sizes which you can have.



Example 1:

Input: slices = [1,2,3,4,5,6]

Output: 10

Explanation: Pick pizza slice of size 4, Alice and Bob will pick slices with size 3 and 5 respectively. Then Pick slices with size 6, finally Alice and Bob will pick slice of size 2 and 1 respectively. Total = 4 + 6.

(***Note: Use Dynamic Programming Approach)***

2. You are given with a bag of n balls indexed from 0 to n-1. A number is written on each ball represented by an array numbers. You are asked to pick up all the balls from the bag. If you take i^{th} ball, you will get numbers[i-1] * numbers[i] * numbers[i+1] coins. If i-1 or i+1 goes out of bounds of the array treat it as if there is a ball with 1 written on it. Find the maximum coins you can collect by taking the balls wisely.

    Example:

    Input: nums = [3,1,5,8]

    Output: 167

Explanation: nums = [3,1,5,8] --> [3,5,8] --> [3,8] --> [8] --> [] coins = 3*1*5 + 3*5*8 + 1*3*8 + 1*8*1 = 167

(Note: Use Divide and Conquer Approach)