Circular Tour [GFG](https://practice.geeksforgeeks.org/problems/circular-tour-1587115620/1)

**Problem Statement:** Given an array of petrol pumps where each petrol pump has a certain amount of petrol and a distance to the next petrol pump, you need to find the starting petrol pump from which you can complete a circular tour.

**Approach 1: Brute Force approach to find the starting point for a circular tour.**

* In this approach, we use brute force to check each petrol pump as a potential starting point.
* We iterate through all pumps and, for each pump, check if it can complete the circular tour.
* If a starting point is found that can complete the tour, we return that index; otherwise, we return -1.

**Time Complexity: O(n^2) where n is the number of petrol pumps.**

**Space Complexity: O(1)**

**Approach 2: Optimized approach to find the starting point for a circular tour.**

* This approach optimizes the solution by keeping track of the balance of petrol and deficit while traversing the pumps.
* If the balance becomes negative at any point, it means the current starting point cannot complete the tour, so we try the next pump as a starting point.
* We accumulate the deficit and continue to check for a valid starting point.
* If the total balance plus the deficit becomes non-negative, we return the starting point; otherwise, we return -1.

**Time Complexity: O(n) where n is the number of petrol pumps.**

**Space Complexity: O(1)**

**Approach 3: Queue-based approach to find the starting point for a circular tour.**

* This approach is similar to the optimized approach but also uses a queue to keep track of potential starting points.
* Whenever the balance becomes negative, we clear the queue and start searching for a new starting point.
* If a valid starting point is found, we return that index; otherwise, we return -1.

**Time Complexity: O(n) where n is the number of petrol pumps.**

**Space Complexity: O(n) in the worst case, when all pumps are potential starting points.**