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**Analysis and Design of Algorithms**, Winter Term 2023
**Programming Assignment 2: Clone Force 99 Episode $\alpha$**

*Due: December $14^{th}$ 2023*

## 1. Problem Description:

After Tech managed to find out that they would be able to reach planet Naboo from Tatooine, he realised that they needed to be as discrete as possible. To do that Tech decided to minimize their landings as much as possible. You need to help Tech to:

a) Design a Dynamic programming algorithm that outputs the minimum number of planets the Bad Batch needs to land on and fuel to reach Naboo. The algorithm should run in $O(n^2)$.
b) Reconsruct a path that leads to Naboo with that minimum number of landings. The algorithm should run in $O(n^2)$.

## 2. Deliverables.

You are required to submit one **Java** file titled `TheBadBatchPath` containing the following methods. The class name must be `TheBadBatchPath` and the class must have a package name `csen703.main.assignment2`.

a) `public static Integer TatooineToNabooDP(int [] fuel)` that implements a dynamic programming approach to finding the minimum number of landings to reach planet Naboo. Notice that you always land on Naboo anyway.
b) `public static ArrayList<Integer> TatooineToNabooPath(int [] fuel)` that returns an ordered minimum path of the planets indices the BadBatch should land on to reach Naboo. Notice that Tatooine and Naboo are always the start and end of this path. If there are multiple minimum paths, you only return one of them.

Notice that using static variables might mess up the test cases, therefore we advise against using static variables. There are other workarounds that you can do.

## 3. Sample Input/Output

```
fuel=[2,3,1,1,4]
Output DP: 2
Output path: {0,1,4}
```

## 4. Submission Guidelines.

a) Your assignment will be auto-tested. For this reason, **you have to stick to the method signatures, the class name, the package name and the output format.** However, you are allowed to use any helper methods you need.
b) You must enter your team number correctly as will be posted in the teams' list.
c) This is the *link* for submission.