CO322: Data Structures and Algorithms

Lab 6

Aim: the aim of this lab is to develop an algorithm based on what you already know to solve a different problem.

Problem:
Suppose you are given a stack of *n* pancakes of different sizes. You want to sort the pancakes so that smaller pancakes are on top of larger pancakes. The only operation you can perform is a flip — insert a spatula under the top k pancakes, for some integer k between 1 and n, and flip them all.

Task:

1. Describe an algorithm to sort an arbitrary stack of n pancakes using as few flips as possible. Exactly how many flips does your algorithm perform in the worst case?

2. What is the worst case runtime of your algorithm?

3. Describe a way to represent the problem. What data structure(s) will you use?

What to submit: write a program that takes *n* as a command line argument and display the instructions for flipping the pancakes. Submit your code via Moodel. Put all assumptions as comments.

Deadline: 18th May 2018 at 11.55 pm (You have to submit a single zipped file renamed as e14xxx.zip where xxx is your registration number.Strictly no late submissions.)