CS210
Lab 4

Welcome to Lab 4 of CS210. This entire lab is designed to practice greedy algorithms.

Objectives

The **objectives of this Lab** are:

- To gain insight on greedy approach.

Useful Topics:

For this lab, you may find it useful to review some of the following concepts:

- Big Oh notations
- Greedy approach

Task 1 4 marks

Given some coin denominations, your goal is to make change for amount S using minimum number of coins. Write a code to find the minimum number of coins using the greedy approach. For example: Given a coin denomination say, $1, 5, 10, 20, 50$. You want change for 37 cents, optimal way is: $1 \times 20, 1 \times 10, 1 \times 5, 2x1$.
example
`Please enter denominations:`$1, 5, 10, 20, 50$
`Please enter the amount you want to change:`30
`Your denominations:`$1 \times 20, 1 \times 10$

Task 2 6 marks

Marc loves cupcakes, but he also likes to stay fit. He eats cupcakes in one sitting, and each cupcake i has a calorie count, C_i . After eating a cupcake with C calories, he must walk at least 2^jxC (where j is the number cupcakes he has already eaten) miles to maintain his weight. That is if Marc ate n cupcakes, then he needs to run $\sum_{i=0}^{n-1}(2^i \times c_i)$ miles.

Given the individual calorie counts for each of the n cupcakes, write a code using greedy approach to find and print a number denoting the minimum number of miles Marc must walk to maintain his weight. Note that you will determine the order in which Marc will eat the cupcakes to minimise the walking distance.

Example:

```
Please enter the number of cupcakes: 3
Respective calorie counts of each cupcake: 1 3 2
Marc should walk at least 11 miles.
```