15-110: Principles of Computing

Homework 03

Due: 22nd September, 2020 at 23:59

- You must solve the tasks **individually**.
- There are 50 points.

1. (20 points) **Set kth digit**

   Implement the function `setKthDigit(n, k, d)` that takes three integers – `n, k, d` – where `n` is a possibly-negative int, `k` is a non-negative int, and `d` is a non-negative single digit int (between 0 and 9 inclusive). This function returns the number `n` with the `k`th digit replaced with `d`. Counting starts at 0 and goes right-to-left, so the 0th digit is the rightmost digit.

   For example:

   ```
   setKthDigit(468, 0, 1) == 461
   setKthDigit(468, 1, 1) == 418
   setKthDigit(468, 2, 1) == 168
   setKthDigit(468, 3, 1) == 1468
   setKthDigit(468, 1, 0) == 408
   ```

2. (10 points) **Getting A**

   If you get more than 90% in a course, an A is (almost always) guaranteed. It is useful to keep track of your grades during the semester to find out if you could still get an A in a course or not.

   Implement the function `canGetA(pts, graded, total)` that takes as input the number of points `pts` you have in the course so far, the number of points `graded` that were already graded, and the `total` number of points of the course. The function returns `True` if it is still possible for you to get an A, and `False` otherwise.

   For example, `canGetA(50,70,100)` should return `False`.

3. (10 points) **Leap Year**

   A leap year is one that is divisible by 4 and not divisible by 100, except if it is divisible by 400.

   Implement the function `leapYear(y)` that returns `True` if the year `y` is a leap year, or `False` otherwise.

4. (10 points) **Age Calculator**

   The age of a person is determined by the date they were born.

   Implement the function `calculateAge(bd, bm, by, d, m, y)` that takes as input the birthday day, month, and year (`bd, bm, by`), and a date (`d, m, y`), and returns how old the person is on that date.

   For example, `calculateAge(15,4,1998,25,1,2020)` should return 22.

   You may consider that the age of a person is increased on the first second of their birthday.