CSE 4321/5321 Homework 1

Spring 2017

Question 1-3 worth 30 percent each. Question 4 is worth 10 percent. 100 points total

Guidance for all problems:

1. Develop the minimum set of test cases needed to adequately test all actions and boundary values.
2. List all inputs and expected outputs using the test case table depicted in the previous HW 1 solution.
3. Develop the test needed for all partitions with two test cases per partition.
4. Assume that currency is truncated to the cent.
5. State any assumptions made, but do not change the function of the problem.

The following are customer descriptions of software scenarios. For each problem state any assumptions made - but **do** **not** **change** the function being described.

1) Arlington Bank credits/debits accounts as follows. If the account balance is between $2,000 and $7,500 the interest paid is 2.35%. If account balance is less than or equal to $2,000 the interest paid is 2.15%. If less than or equal to $0 it assess a $35 overdraft/disuse fee and no interest is paid. If the account balance is greater than $7,500 it pays 2.55% interest. If the account balance is greater than or equal to $15,000 it pays 2.95% interest, if greater than $25,000 it pays 3.15% interest and if the account balance is greater than or equal $30,000 it pays 3.25% interest and the account owner will receive an "honored" status which means that on the bank anniversary the account owner will receive a $75 Starbucks gift card. The software calculates the interest to be paid, fees, and awards. Account status is used to obtain gift cards. The bank always calculates only the highest applicable interest rate.

2) Arlington Airlines measures traveler frequency on its aircraft and the software has been designed to count this volume. The tester is assigned the task of developing test cases needed to test all actions and boundary values. The software counts the volume of passengers - these requirements are specified elsewhere - the customer desires that the tester develops acceptance tests based on the analysis of the volume which is the following.

Holiday travel volume is 350 percent higher than weekend volume. Weekend volume reduces by 20% over business day (M-F) travel. The average weekday rate of passengers is 12,000 passengers/day. Volume increases for travel that departs between 5am and 9am (high volume traffic) by a factor of 2.33 over average hourly volume. ﻿﻿All high volume traffic uses this same factor. Low volume traffic occurs for local departures from 9am until 3pm. High volume traffic also applies to flights leaving on or after 3pm until 6pm. Flights later than and including 6pm revert back to Low volume traffic until 5am.

Additional guidance:

1. Volume calculations are always truncated to the nearest whole - never rounded up.
2. Assume significance of 1 second on time.
3. For the test cases start the day at 12 midnight (12:00:00 "am"). You must show time significance to the nearest second.

3) A car uses gas at a rate of 25 miles/gallon. The owner drives his car 62.5 miles/day and has a gas tank of 25 gallons. He drives at an average speed of 50 miles/hour with a maximum of 70 mph. He likes to listen to music and is sometimes a little distracted so he forgets to pay attention to stop lights and stop signs (stop indicators) getting several tickets and now runs the risk of having his license taken away. He got an upgrade to his car made by a local dealer so that it now has a red light, yellow light, green light, and buzzer that are triggered at 100 feet, 75 feet, 50 feet and 25 feet from a stop indicator respectively. He is hoping this will solve his problem.

Additional guidance:

1. Assume all values are Java doubles with a significance of 0.1.
2. Also assume that when the car passes the stop indicator or when it first starts, all alerts reset.

4) Arlington Bank (problem 1) was sued by a disgruntled former sales person who wanted a larger reward for the "honored" account owner. The settlement wasn't exactly what she wanted but the top status account is now based on two new levels of recognition: "Honored status" if the total balance including interest is over $45,000 and "Top-status" if the total balance including interest is $55,000 or higher. Honored status means that at the Bank Anniversary date he/she will receive a $100 Amazon gift card and Top-status $135 account credit.

Additional guidance:

1. Provide only the test cases that must be added to test these new award rules and levels.
2. Use balance with interest and compute the new tests cases as in Problem 1.
3. The input to the test cases is the pre-interest account balance.
4. The outputs include the total balance (balance with interest and other credits).