PYTHON PROGRAMMING ACTIVITY #3

CASE STUDY Water Bill Problem

PROBLEM

Write a program that computes a customer's water bill. The bill includes a $35 water demand charge plus a consumption (use) charge of $1.10 for every thousand gallons used. Consumption is figured from meter readings (in thousands of gallons) taken recently and at the end of the previous quarter. If the customer's unpaid balance is greater than zero, a $2 late charge is assessed as well.

ANALYSIS

The total water bill is the sum of the demand and use charges, the unpaid balance, and a possible late charge. The demand charge is a program constant ($35), but the use charge must be computed. To do this, we must know the previous and current meter readings (the problem inputs). After obtaining these data, we can compute the use charge by multiplying the difference between the two meter readings by the charge for 1000 gallons, the problem constant $1.10. Next, we can determine the applicable late charge, if any, and finally compute the water bill by adding the four components. The data requirements and initial algorithm follow.

DATA REQUIREMENTS

Problem Constants

```
DEMAND_CHG 35.00     /* basic water demand charge                */
PER_1000_CHG 1.10    /* charge per thousand gallons used         */
LATE_CHG 2.00        /* surcharge on an unpaid balance           */
```

Problem Inputs

```
int previous  /* meter reading from previous quarter
                 in thousands of gallons                          */
int current   /* meter reading from current quarter               */
double unpaid /* unpaid balance of previous bill                  */
```

Problem Outputs

```
double bill        /* water bill                                 */
double use_charge  /* charge for actual water use                */
double late_charge /* charge for nonpayment of part
                      of previous balance                        */
```

Relevant Formulas

water bill = demand charge + use charge + unpaid balance + applicable late charge

SAMPLE RUN OF THE WATER BILL PROGRAM:

Enter unpaid balance> **Php71.50**
Enter previous meter reading> **4198**
Enter current meter reading> **4238**

Bill includes Php2.00 late charge on unpaid balance of **Php71.50**

Total Due = Php152.50