

CS112 - Intro to Problem Solving and Programming Lab Assignment #2

Summer 2004

The purpose of this assignment is to use decision making statements (`if`, `if-else`, and `switch-case` in a C++ program.

Avista Utilities provides electricity to this area. They use rather complicated formulas to determine the charges for their services. They also use different rate schedules for residential and commercial customers. Each schedule consists of one or more of the following charges:

- A basic charge - a charge that is levied whether the customer uses any power or not.
- An energy charge - the actual cost of the energy used. Energy is measured in kilowatt-hours (kWh), and the cost of the energy used is determined by multiplying the kWh by the cost per kWh. On some schedules, the amount per kWh varies, depending upon the total amount of energy used.
- A demand charge - a cost associated with the maximum rate of energy use, measured in kW. This charge is determined by multiplying the kW rate by the demand charge per kW.
- A voltage discount - Some customers receive a discount on the demand portion of their bill, determined by multiplying the discount rate by the demand rate.

Not every type of customer pays every type of charge. Only that information that is required for that type of customer is input to the program.

The type of customer is determined by a *schedule* number. The list on the next page summarizes each type of customer and the charges that are pertinent to that customer.

For this assignment, you are write a program that will input a customer number (up to 6 digits), a schedule number (the legal values are 1, 11, 12, and 21), and then only the information about that customer that is relevant to compute the bill for that type of customer. All customers will have an energy use (kWh) - this is the only information required for schedule 1 customers. Other customers will have a demand amount (kW), and schedule 21 customers will need to have an indication (Y - for yes, N - for no) whether they should receive a voltage discount. Your program should then output the customer number, all the parameters that were input, and the computed electricity bill.

Test your program for several different customer types - enough to show that it computes the bill properly for each type of customer, and each scenario.

Schedule 1 - Residential	Rate
Basic charge	\$ 4.00000
Energy Rate - first 600 kWh	0.05255
Energy rate - over 600 kWh	0.06156
Demand rate	None
Schedule 11 - Small commercial	Rate
Basic charge	\$ 6.00000
Energy Rate	0.07971
Energy rate - first 20 kW	0.00000
Demand rate - over 20 kW	3.50000
Voltage discount	None
Schedule 12 - Large commercial	Rate
Basic charge	\$ 6.00000
Energy Rate	0.07719
Energy rate - first 20 kW	0.00000
Demand rate - over 20 kW	3.00000
Voltage discount (if eligible)	0.20000
Schedule 21 - Industrial	Rate
Basic charge	\$ None
Energy Rate	0.05022
Energy rate - up to 50 kW (fixed rate)	225.00000
Demand rate - over 50 kW (per kW)	2.75000
Voltage discount (if eligible)	0.20000