The company is made up of employees. Every employee has an employee ID, a first name, a last name, a birth date, a social security number (tax id number), an employment start date, and an employment end date. They also either have an hourly rate (hourly employee) or an annual salary (salaried employee).

NOTE: pay periods are a complex topic and calculating monthly or annual reports when employees are paid every two weeks can be complicated because pay periods may start and end in different months or different years. For the purposes of this system it will be assumed that all employees are paid semi-monthly (twice per month or 24 times per year). This will simplify the calculation of month and annual reports.

Employees can have zero or more dependents. Dependents have a first name, last name, a birth date, and an indicator if they are a spouse. If a dependent is a spouse then they are eligible for medical regardless of age. Otherwise they are only eligible for medical until they are age 24.

Employees choose a health plan. Each plan has an annual rate defined and each employee pays a percentage of that rate. For the purposes of this example each employee will pay 50% of the overall rate, but this value should be stored in the database so it is easy to change. There is one total annual rate for adults and another total annual rate for children.

Hourly employees clock in and out every day. For this example, the time clock system will be considered as an external system that produces a report for each pay period defining the start and end time an employee worked for each day within the pay period.

After a pay period has concluded supervisors must approve time cards. The output of the time card approval system is the number of hours each hourly employee worked in a pay period, how many of those hours are at the normal rate, and how many of those hours are at an overtime rate (time and a half). The initial version of this example will assume that the time card approval system is an external system that provides INPUT to this system.

### Payroll Process

At the end of each pay period a “payroll” process runs that determines the total pay for each employee during the pay period. For salaried employees, the total pay is the annual salary divided by 24 (the total number of pay periods in a year). For hourly employees, the total pay is the number of regular hours worked times the hourly rate plus the number of overtime hours worked times the hourly rate times 1.5.

Once an employee’s total pay for a pay period has been calculated payroll tax is subtracted. For this example, it will be assumed that the payroll tax is a flat 20%.

Next, the health plan payroll deduction is calculated. The formula for this deduction is as follows:

Where the 0.50 factor reflects the percentage of the total health care plan costs that are paid by the employee.

The total pay issued to each employee is the amount that remains after the payroll tax and the health plan deduction are removed from the total pay for the pay period.

A monthly report is issued that dictates the total payroll for the company. This includes the total cost, the amount paid to the IRS for that month (the sum of all taxes deducted from employees pay) and the total health care costs paid by the company (health care costs NOT paid by the employee).

An annual report is issued for each employee that specifies the following:

* Total pay
* Total tax deducted
* Total health plan costs deducted
* Total health plan costs covered by the company