Introduction Programming Example

Problem Description: A small company needs an interactive program to compute an employee paycheck. A payroll clerk will input the data for an employee, and the program is to display the employee’s wages on the terminal screen.

Input: The payroll clerk is to enter in the employee’s identification number, hourly pay rate and the number of hours worked.

Output: Write the employee’s information to the terminal: Id number, pay rate, hours worked and wages

Discussion: We need to determine what employee information needs to be input. From the input section above, we know that the Id number, hourly wage and hours worked for the week are input. From this information the weekly paycheck amount needs to be computed. For all hours worked up to 40, the employee is paid their regular wage per hour. For all hours over 40, the employee is paid 1.5 times their regular wage per hour.

From the information above, we can decide on three major parts to the program – reading the information, processing the information and writing out the results. Therefore, as a start to the algorithm to solve the problem we will use these three major areas and expand on their details. Since there are two methods required to calculate an employee’s wages, a function is used for that part of the program( This reduces the amount of code visible in main).

Assumptions: All values entered are positive and valid numbers.

Functional Decomposition: (Algorithm Solution)

Main – Paycheck Calculation
Prompt the user for the employee number
Read the employee number
Prompt the user for the employee’s hourly pay rate
Read the employee’s pay rate
Prompt the user for the number of hours worked
Read the number of hours worked
CalculateWages using a sub-algorithm (function) – pass in hours worked and pay rate
Receive wages back
Write out the employee number, pay rate, hours worked and wages on the screen
End of program

CalculateWages(IN: float payRate, float hours; OUT: float& wages)

Test hours to see if it is greater than 40.
If hours is greater than 40, then
wages = 40.0xpayRate + (hours-40.0)xpayRate*1.5
Otherwise
wages = hours*payRate
Program Output:

C:\paycheck.exe
Enter employee number: 5
Enter pay rate: 45
Enter hours worked: 34
****************** Output Information ******************
Employee: 5
Pay rate: 45
Hours: 34
Wages: 1530

C:\paycheck.exe
Enter employee number: 10
Enter pay rate: 35
Enter hours worked: 55
****************** Output Information ******************
Employee: 10
Pay rate: 35
Hours: 55
Wages: 2187.5