Step 5 Summary

Step 5A Working Time

The time the driver begins work and ends work is recorded in the Recorder class in the methods *recordDriverBeginsWork*() and *recordDriverEndsWork*(). These two methods will be called in the Driver class in the methods *arriveForWork*() and the new method *goesHome*() replacing the trace messages.

The class Recorder is extended by a data frame daily that will cover all sorts of data that will be collected for each day. There are two columns 'begin work at' and 'end work at' which will be filled by the methods *recordDriverBeginsWork* and *recordDriverEndsWork*. The *finish*() method in the Recorder class is expanded by the creation of the 'working time' column which is initialised as difference of 'end work at' and 'begin work at'.

New Plotting Routines *histPlot*() and *dailyPlot*() have been introduced in the new section *2.6 Plotting Routines* and are utilised in the Recorder class for special plotting routines *histWorkingTime*() and *plotWorkingTime*(). The idea is that all other histogram and plotting routines for daily data will be implemented similarly.

Step 5B Daily Tour Length

The Recorder class is extended by a method *recordTourLength*() and an additional column 'tour length' in the dataframe daily as well as the matching plotting routines *histTourLength*() and *plotTourLength*(). The *process*() method in the class Driver is refined by adding the *recordTourLength*() twice, once for 'Nothing to do today' and once recording the actual tour length of the day.

Step 5C Operational Costs

The finish() method of the Recorder class is extended by the creation of a column 'cost' in the dataframe daily. Additionally plotting routines are added to the

Step 5D Parcels

This introduces a number of extensions related to the statistics for parcels.

The dataframe *daily* in the class Recorder is extended by columns 'parcels arrived' , 'parcels out for delivery', 'parcels returned from delivery', 'parcels delivered' and 'parcels left over' together with the matching *recordParcel*...() methods.

Additionally a new dataframe *parcel* has been created with one row per parcel which is updated with the day at which a parcel arrived and was ultimately delivered. In the finish() method of the Recorder class, the delivery delay is computed as difference of delivery day and arrival day.

Additional plot and histogram methods are added to the class Recorder as well.

Step 5E Count Plots

An addional method countPlot() has been added to section 2.6 Plotting Routines. The finish() method in the class Recorder has been extended to insert columns ‘cum arrival’ and ‘cum delivery’ containing the cumulative sums for the parcels arrived/delivered per day.