

The collection of raw data provides researchers, engineers, and planners the opportunity to extrapolate conventional and understood metrics from a series of times, speeds, and other raw values. R is an excellent platform for such tasks as looping algorithms can be generated to calculate the required metrics. This activity explores the use of looping using the *trimet* data frame to generate headway values between bus stops.

 **PURPOSE**

The purpose of this activity is to allow you to further investigate the looping function and the applicability of R in generating algorithms to process raw data.

 **LEARNING OBJECTIVE**

Use the loop with your own function to generate a working algorithm.

 **REQUIRED RESOURCES**

- o R
- o R Studio

 **TIME ALLOCATED**

60 minutes in class
20 minutes out-of-class

TASKS



Imagine that you have been asked to create a scatterplot of the time between buses (headway) by time of day at each *stop_id* in the dataframe *trimet*. To keep this simple, let's do this for just one day: March 8, 2007. We can ignore *direction* since stops are numbered individually.

Your first task is to write the pseudo-code and share it with your instructor. You can type this, but you can also just write it on a blank sheet of paper. Write the steps out such as:

7. Read in the *trimet* data table
8. Determine the possible set of stop ids
9.

A sample of the plot for headways at one stop (2107) is shown in Figure 36.

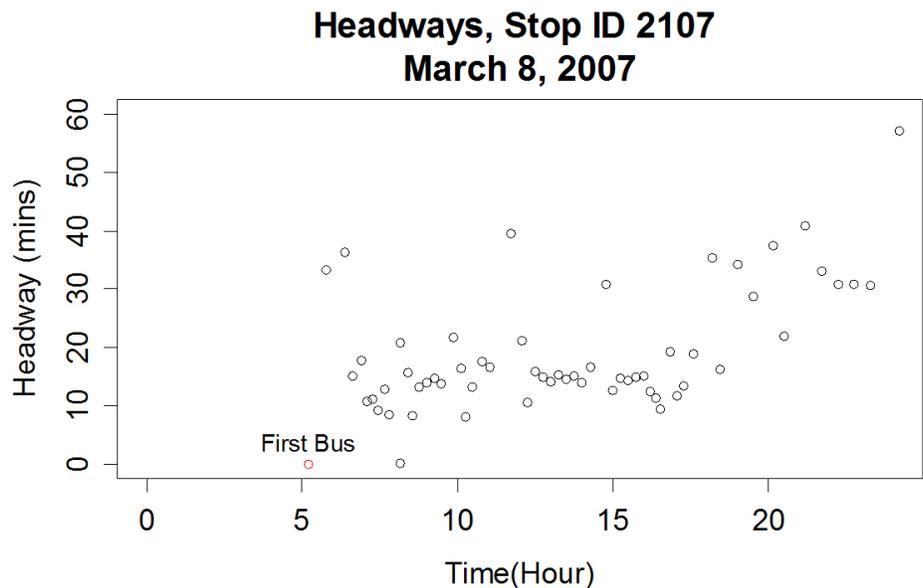


Figure 36 Headways at Stop ID 2107, March 8, 2007

Some tips for you to think about:

- You are only required to plot the data (not store it).
- There are 3 columns for time at each stop; use the `arrive_time` to calculate headway
- Take a look at the time order of the data (plot the `arrive_time` field), as it may need to be sorted in order to determine headways. This can be done with `order` function. The syntax is rather clumsy: <http://www.statmethods.net/management/sorting.html>. Note in this example the dataframe is “attached” which allows the sorting column (`mpg`) to be referred to without its full name `mtcars$mpg`.

Now, write the code to do this. Remember to incrementally build your code. Be sure to add the **stop id** to the main titles of the graphs. Arrange the plots in a 4×4 window. Save your R script file. Clear the list of objects in R memory, then rerun your script to make sure all works.

DELIVERABLE



Submit your script file to the class dropbox submission. Include comments on constructing this function + loop.

ASSESSMENT



Activity 19 Grading Rubric

	Excellent (10)	Good (8)	Poor (6)	NONE
Script	Organized, complete, accurate and executes.	Missing minor parts, but executes and is otherwise organized and accurate.	Missing significant portions of the activity, unorganized, inaccurate, but executes.	Code does not execute
Graphic/ Annotation	Graphic and/or annotations are complete and describe what the code is accomplishing.	The graphic(s) or some annotations are incomplete or do not describe what the code is accomplishing.	No graphics or annotations were provided.	Code does not execute
Discussion/ Commentary	Insightful discussion or commentary relating to the question at hand demonstrating student understanding of the task.	Discussion or commentary was incomplete.	Minimal to no discussion or commentary.	Code does not execute