

## HW 2

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PART 1 1. `paste()` is a very useful function in creating strings with certain patterns. In the following example, it can automatically concatenate numerical and character values together. In other programming languages, they usually can't be as smart because these two data types are not compatible, unless conversions are explicitly done. Please explain what happens in terms of data coercing and object recycling.

Answer:

It converts arguments into character strings. If a vector is passed as an argument, it is going to get concatenated term by term to give a character vector.

```
grades = read.table('http://pengstats.macssa.com/download/rcc/grades.csv',
header=T, sep=",", fill=TRUE);
grades[is.na(grades)] = 0;
grades$final =
100*0.2*(rowSums(grades[,3:10])/40)+100*0.2*(rowSums(grades[,11:15])/50)+100*
0.6*(rowSums(grades[,16:18])/300);
grades[1:5,c(1,2,19)];

##      Session UserID final
## 1          A      1 92.85
## 2          A      2 64.35
## 3          A      3 23.60
## 4          A      4 72.05
## 5          A      5 77.05

lmdata = read.table('http://pengstats.macssa.com/download/rcc/lmdata.csv',
header=T, sep=',', fill=TRUE);
X = as.matrix(cbind(1,lmdata[,2:3]));
solve(t(X) %*% X) %*% t(X) %*% lmdata[,1];

##           [,1]
## 1  0.6520635
## x1 2.0228981
## x2 0.6022980
```

PART 2 1.

```
grade = read.table('http://pengstats.macssa.com/download/rcc/grades.csv',
header=T, sep=",", fill=TRUE);
grades_cal = function (grade, hw_w, quiz_w, exam_w){
grade$calc =
100*hw_w*(rowSums(grade[,3:10])/40)+100*quiz_w*(rowSums(grade[,11:15])/50)+100*exam_w*(rowSums(grade[,16:18])/300)
```

```

0*exam_w*3*(rowSums(grade[,16:18])/300);
return(grade[1:5,c(1,2,19)]);
}
grades_cal(grades,0.2,0.2,0.2);

##      Session UserID final
## 1          A          1 92.85
## 2          A          2 64.35
## 3          A          3 23.60
## 4          A          4 72.05
## 5          A          5 77.05

funcdata = read.table('http://pengstats.macssa.com/download/rcc/lmdata.csv',
header=T, sep=',', fill=TRUE);

slm = function(data){
  X = as.matrix(cbind(1,data[,2:3]));
  return(solve(t(X) %*% X) %*% t(X) %*% data[,1]);
}
slm(funcdata);

##           [,1]
## 1  0.6520635
## x1 2.0228981
## x2 0.6022980

```