CSC 120 (R Section) — Quiz #3 — 2015-03-13

No books, notes, or calculators are allowed. You have 25 minutes to write this quiz.

**Question 1:** [32 marks] In the four blank spaces below, write the output that R will produce:

```r
> set.seed(654321)
> runif(1)
[1] 0.09940678
> runif(1)
[1] 0.509636
> runif(1)
[1] 0.9208333
> set.seed(654321)
> v <- rep(1,5)
> v

> if (runif(1) < 0.2) v[1] <- 0 else v[5] <- 0
> v

> if (runif(1) < 0.5) v[2] <- 0 else v[4] <- 0
> v

> v[3] <- runif(1)
> v
```

**Question 2:** [32 marks] In the three blank spaces below, write the output that R will produce:

```r
> M <- matrix (seq (0.1, 0.9, length=9), nrow=3, ncol=3)
> rownames(M) <- c("mary","fred","sam")
> colnames(M) <- c("x","y","z")
> M

> M["mary","z"]

> M["fred",2:3]```
Question 3: [36 marks] Write down a definition for a function called `fill_in_renter` that takes as its only argument a data frame that has variables `renter` and `student`, both of which are logical variables, whose values are TRUE, or FALSE, or NA if the value is missing. The data frame may also have other variables. This function should return a data frame that is like its argument, except that any occurrences of NA for the `renter` variable are replaced by TRUE if the value of the `student` variable in that row is TRUE, and by FALSE if the value of the `student` variable is FALSE, and if both `renter` and `student` in a row are NA, the value of `renter` is set to TRUE or FALSE randomly, with equal probabilities for these two values.

Here is an example:

```r
> df
   renter student age
1    TRUE     TRUE  25
2     NA     TRUE  19
3    FALSE     TRUE  NA
4    FALSE    FALSE  31
5     NA      FALSE  42
6     NA      NA   29
> fill_in_renter(df)
   renter student age
1    TRUE     TRUE  25
2    TRUE     TRUE  19
3    FALSE     TRUE  NA
4    FALSE    FALSE  31
5    FALSE      FALSE  42
6    TRUE      NA  29
```

Note that the value of `renter` in the last row above was filled in randomly, so in another call of `fill_in_renter(df)`, it might be FALSE rather than TRUE.