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

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

```
> 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
ANSWER: 1 1 1 1 1 1
> if (runif(1) < 0.2) v[1] <- 0 else v[5] <- 0
> v
ANSWER: 0 1 1 1 1
> if (runif(1) < 0.5) v[2] <- 0 else v[4] <- 0
> v
ANSWER: 0 1 1 0 1
> v[3] <- runif(1)
> v
ANSWER: 0 1 0.9208333 0 1
```

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

```
> M <- matrix (seq (0.1, 0.9, length=9), nrow=3, ncol=3)
> rownames(M) <- c("mary","fred","sam")</pre>
> colnames(M) <- c("x","y","z")</pre>
> M
ANSWER:
       х
           y z
mary 0.1 0.4 0.7
fred 0.2 0.5 0.8
sam 0.3 0.6 0.9
> M["mary", "z"]
ANSWER: 0.7
> M["fred",2:3]
ANSWER:
  у
      z
0.5 0.8
```

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:

>	df		
	renter	$\mathtt{student}$	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_ir	n_renter((df)
>	fill_in renter	n_renter(student	(df) age
> 1	fill_in renter TRUE	n_renter(student TRUE	(df) age 25
> 1 2	fill_in renter TRUE TRUE	n_renter(student TRUE TRUE	(df) age 25 19
> 1 2 3	fill_in renter TRUE TRUE FALSE	n_renter(student TRUE TRUE TRUE	(df) age 25 19 NA
> 1 2 3 4	fill_in renter TRUE TRUE FALSE FALSE	n_renter(student TRUE TRUE TRUE FALSE	(df) age 25 19 NA 31
> 1 2 3 4 5	fill_in renter TRUE FALSE FALSE FALSE	n_renter(student TRUE TRUE TRUE FALSE FALSE	(df) age 25 19 NA 31 42

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**.

ANSWER: