A stupidly simple U2W example

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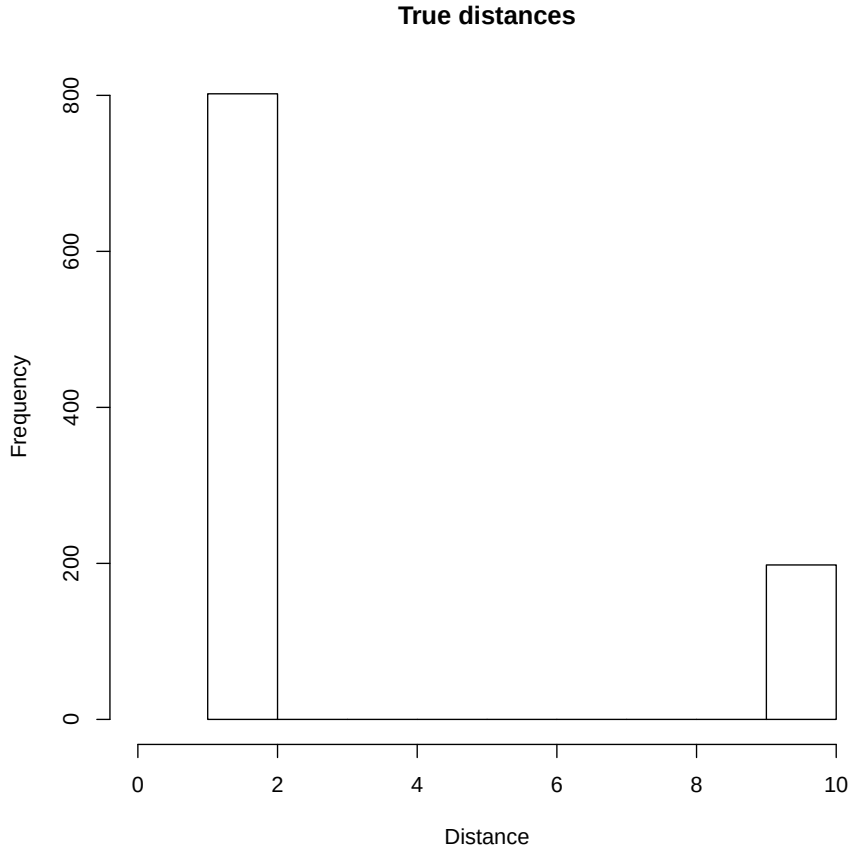
1 Setup

Suppose we have a firm with one establishment with of size 800, and 20 smaller establishments of size 10. Workers all live 1 km away from the larger establishment, and 10 km from the smaller establishments. The true distribution of distances thus looks like



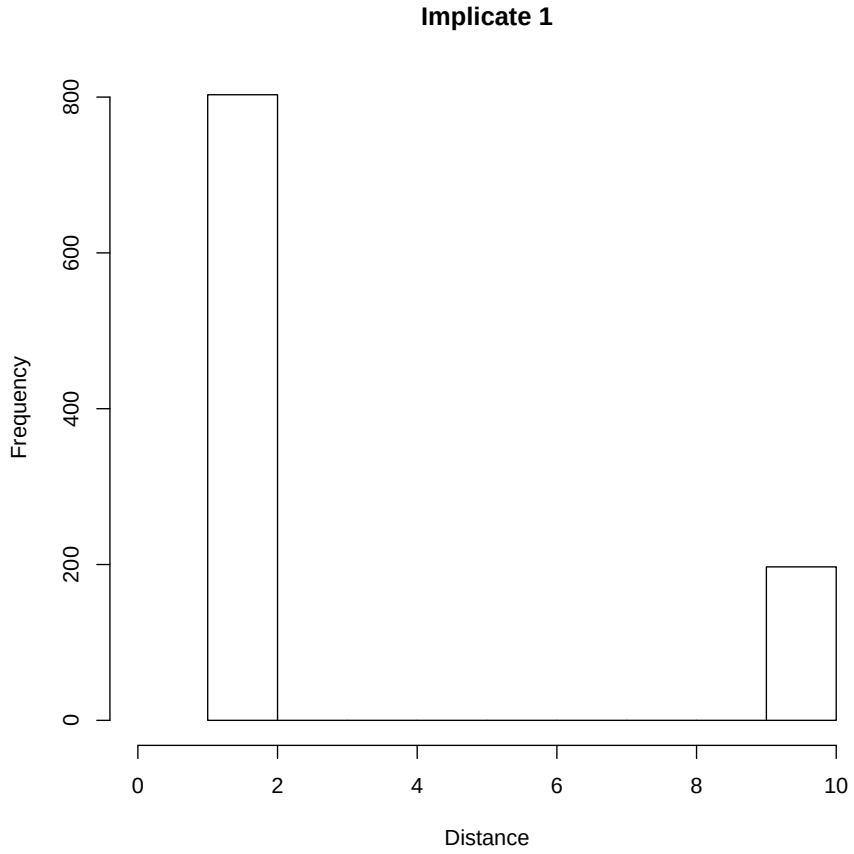
2 A stupid simple U2W

In the U2W, we don't know what the true connection with workers looks like, so we have a model, based on distance and feasible establishments, imputes a link. From the model, 10 are drawn for each job.

The expected distance in each job is therefore

$$E[d_{ij}] = \sum_j p_{ij} d_i j \tag{1}$$

which in our simple setup is **2.8 km**, which is also in this particular case the average distance in the data. In the U2W, we draw from this distribution 10 times, which yields a distribution of distances for a single implicate as follows:

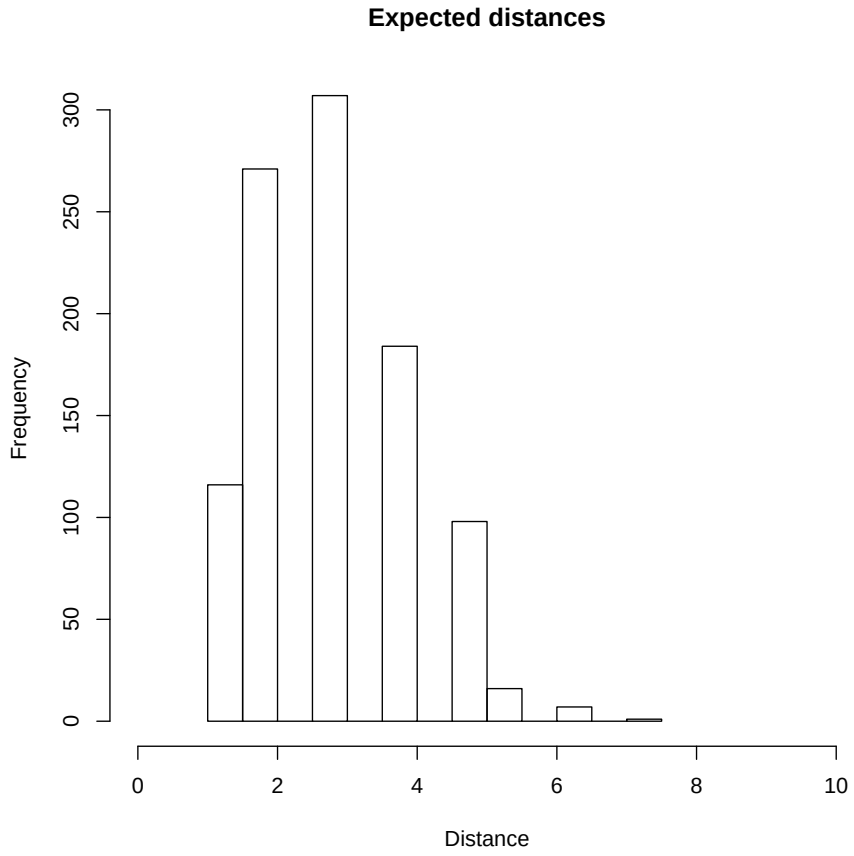


Let's draw 10 samples for each job, then compute the expected distance for each job. Across all draws, we of course get the (approximately) correct distribution of employment across big and small establishments (weighted with 1/10):

	multimp
1	804.20
10	195.80

3 Computing expectations first

However, if we compute the expected distance per job, we get an average distance of **2.7622**, but the distribution of distances looks like this:



4 Other information

```
set.seed(123)
```

```
Sys.info()
```

```
##                                                    sysname
##                                                    "Linux"
##                                                    release
##                                         "3.16.7-29-desktop"
##                                                    version
## "#1 SMP PREEMPT Fri Oct 23 00:46:04 UTC 2015 (6be6a97)"
##                                                   nodename
##                            "garnier.cloutier-vilhuber.net"
##                                                    machine
##                                                   "x86_64"
##                                                      login
##                                                 "vilhuber"
##                                                       user
##                                                 "vilhuber"
##                                              effective_user
##                                                 "vilhuber"
```