

HW9

Q12.1 Describe a situation or problem from your job, everyday life, current events, etc., for which a design of experiments approach would be appropriate.

I am working on a project to get the insights from the grain storage. To be able to select the required sensors and determine which factors to capture for the grain storage. I need to make a stable condition for certain parameters such as humidity, moisture and so on. I am designing my experiments in the controlled silos to make sure that I can control some factors while experimenting the impacts of other factors.

Q12.1

To determine the value of 10 different yes/no features to the market value of a house (large yard, solar roof, etc.), a real estate agent plans to survey 50 potential buyers, showing a fictitious house with different combinations of features. To reduce the survey size, the agent wants to show just 16 fictitious houses. Use R's FrF2 function (in the FrF2 package) to find a fractional factorial design for this experiment: what set of features should each of the 16 fictitious houses have? Note: the output of FrF2 is "1" (include) or "-1" (don't include) for each feature.

```
In [1]: # This part loads the package ccalled FrF2

install.packages("FrF2")
library(FrF2)

features = c("dishwasher", "car-parking", "high-speed-internet",
             "wooden-flooring", "elevator", "gym",
             "central-ac", "good-schools", "backyard", "in-house laundry")

FrF2(16, factor.names = features)
```

package 'FrF2' successfully unpacked and MD5 sums checked

The downloaded binary packages are in

C:\Users\ashka\AppData\Local\Temp\Rtmp2BSgI0\downloaded_packages

Loading required package: DoE.base

Loading required package: grid

Loading required package: conf.design

Registered S3 method overwritten by 'DoE.base':

method from

factorize.factor conf.design

Attaching package: 'DoE.base'

The following objects are masked from 'package:stats':

aov, lm

The following object is masked from 'package:graphics':

plot.design

The following object is masked from 'package:base':

lengths

dishwasher	car.parking	high.speed.internet	wooden.flooring	elevator	gym	central.ac	good.schools	backyard	in.house.laundry
-1	-1	1	-1	1	-1	-1	1	1	-1
1	1	1	1	1	1	1	1	1	1
1	1	1	-1	1	1	1	-1	-1	-1
-1	1	-1	-1	-1	1	-1	1	1	-1
-1	-1	-1	1	1	1	1	-1	1	-1
1	-1	1	-1	-1	1	-1	-1	1	1
1	1	-1	1	1	-1	-1	1	-1	-1
1	1	-1	-1	1	-1	-1	-1	1	1
-1	1	1	-1	-1	-1	1	1	-1	1
-1	1	1	1	-1	-1	1	-1	1	-1
-1	1	-1	1	-1	1	-1	-1	-1	1
1	-1	1	1	-1	1	-1	1	-1	-1
1	-1	-1	-1	-1	-1	1	-1	-1	-1
-1	-1	1	1	1	-1	-1	-1	-1	1
-1	-1	-1	-1	1	1	1	1	-1	1
1	-1	-1	1	-1	-1	1	1	1	1

In []:

In []: