

Assignment3 with Python and R

Settings

Independent simulations with simPy

Calculating results with R

Differences between independent simulations

```
## [1] "Descriptive statistics"
```

```
##   PREP_ROOMS REC_ROOMS MEAN_QUE SD_QUE MEAN_UTI SD_UTI MEAN_BLO SD_BLO
## 1         3         4    0.65   0.86    0.75   0.10    0.17   0.24
## 2         3         5    1.06   1.28    0.73   0.17    0.10   0.28
## 3         4         5    0.25   0.59    0.69   0.12    0.01   0.03
```

```
## [1] "95% confidence intervals for differences between hospitals in mean of average entrance:"
```

```
##   DIFFERENCE    MEAN_D    CI_low  CI_high
## 1      1-2 -0.4159460 -1.11646723 0.2845751
## 2      1-3  0.4011577 -0.07463656 0.8769519
## 3      2-3  0.8171037  0.17085215 1.4633553
```

```
## [1] "95% confidence intervals for differences between hospitals in utilization rate:"
```

```
##   DIFFERENCE    MEAN_D    CI_low  CI_high
## 1      1-2 0.02255235 -0.06699576 0.1121005
## 2      1-3 0.05682112 -0.01353879 0.1271810
## 3      2-3 0.03426877 -0.05853948 0.1270770
```

```
## [1] "95% confidence intervals for differences between hospitals in mean of average entrance:"
```

```
##   DIFFERENCE    MEAN_D    CI_low  CI_high
## 1      1-2 0.07145687 -0.09429532 0.2372091
## 2      1-3 0.15587630  0.04427263 0.2674800
## 3      2-3 0.08441943 -0.04691524 0.2157541
```

```
## [1] "Seems that 0 is included in most of the intervals, two significant differences between hospitals"
```

Dependent (i.e. contrafactual) hospitals with simPy

Calculating results with R

Differences between dependent simulations

```
## [1] "Descriptive statistics for average entrance, utilization rate and blocking time"

##   PREP_ROOMS REC_ROOMS MEAN_QUE SD_QUE MEAN_UTI SD_UTI MEAN_BLO SD_BLO
## 1          3         4      0.65  0.86      0.75  0.10      0.17  0.24
## 2          3         5      0.62  0.84      0.75  0.11      0.03  0.09
## 3          4         5      0.23  0.36      0.73  0.10      0.01  0.03

## [1] "95% confidence intervals for mean differences between hospitals in average entrance:"

##   DIFFERENCE    MEAN_D    CI_low    CI_high
## 1          1-2 0.03223608 -0.01224961 0.07672177
## 2          1-3 0.42136691  0.17815028 0.66458354
## 3          2-3 0.38913083  0.15663796 0.62162370

## [1] "95% confidence intervals for mean differences between hospitals in utilization rate:"

##   DIFFERENCE    MEAN_D    CI_low    CI_high
## 1          1-2 0.002118821 -0.004885604 0.009123246
## 2          1-3 0.013073477 -0.002985931 0.029132884
## 3          2-3 0.010954656 -0.005258344 0.027167655

## [1] "95% confidence intervals for differences between hospitals in mean of blocking time:"

##   DIFFERENCE    MEAN_D    CI_low    CI_high
## 1          1-2 0.13925060  0.05628746 0.22221374
## 2          1-3 0.15738252  0.05897557 0.25578948
## 3          2-3 0.01813193 -0.01133383 0.04759768

## [1] "Seems that this method is more efficient. There are 4 statistically significant differences betw
```

Personal twist's effect tot utilization rate

- Our personal twist is 10% probability of operation cancellation during preparation
- Let's repeat independent sample simulation with 0% probability and compare the results

Calculating results with R

Differences between independent simulations

```
## [1] "Descriptive statistics for utilization rate"

##   PREP_ROOMS REC_ROOMS MEAN_UTI SD_UTI
## 1          3         4      0.80  0.08
## 2          3         5      0.77  0.15
## 3          4         5      0.78  0.12
```

```
## [1] "For comparison original descriptive statistics"
```

	PREP_ROOMS	REC_ROOMS	MEAN_QUE	SD_QUE	MEAN_UTI	SD_UTI	MEAN_BLO	SD_BLO
## 1	3	4	0.65	0.86	0.75	0.10	0.17	0.24
## 2	3	5	1.06	1.28	0.73	0.17	0.10	0.28
## 3	4	5	0.25	0.59	0.69	0.12	0.01	0.03

```
## [1] "Seems that utilization rate is improving a little bit without the twist."
```