interaction_term_explanation

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1 Load libraries

[4]:
```
library(tidyverse)
library(DESeq2)
library(org.Hs.eg.db)
library(modelr)
setwd("/scratch/s/shreejoy/nxu/trap_seq")
```

2 Load data

[15]:
```
dds <- readRDS("proc/dds_wendy.rds")
coldata <- colData(dds) %>% as.data.frame()
rownames(coldata) <- 1:nrow(coldata)
```

3 The example starts here

Here the reference level for the factor `condition` is `WT`. The level that comes first is the reference level.

[17]:
```
colData(dds)$condition
```

1. PTEN_KO 2. PTEN_KO 3. PTEN_KO 4. PTEN_KO 5. WT 6. WT 7. WT 8. WT 9. WT 10. WT 11. PTEN_KO 12. PTEN_KO

Levels: 1. 'WT' 2. 'PTEN_KO'

As a result of using `WT` as the reference level, the interaction term becomes `assayInput:conditionPTEN_KO`, and it has a value of 1 if the corresponding sample belongs to `assayInput` and `conditionPTEN_KO` at the same time.

[19]:
```
model.matrix(~assay + condition + assay:condition, colData(dds))
```

A matrix: 12 × 4 of type dbl

	(Intercept)	assayInput	conditionPTEN_KO	assayInput:conditionPTE
4_7	1	1	1	1
4_7.1	1	0	1	0
4_9	1	1	1	1
4_9.1	1	0	1	0
87	1	1	0	0
87.1	1	0	0	0
90	1	1	0	0
90.1	1	0	0	0
91	1	1	0	0
91.1	1	0	0	0
95_3	1	1	1	1
95_3.1	1	0	1	0

We can change the reference level to `PTEN_KO` by:

[20]:
```
colData(dds)$condition <- relevel(colData(dds)$condition, "PTEN_KO")
```

[22]:
```
colData(dds)$condition
```

1. PTEN_KO 2. PTEN_KO 3. PTEN_KO 4. PTEN_KO 5. WT 6. WT 7. WT 8. WT 9. WT 10. WT 11. PTEN_KO 12. PTEN_KO

Levels: 1. 'PTEN_KO' 2. 'WT'

As a result of using `PTEN_KO` as the reference level, the interaction term becomes `assayInput:conditionWT`, and has a value of 1 when the corresponding sample belongs to both `assayInput` and `conditionWT`.

[21]:
```
model.matrix(~assay + condition + assay:condition, colData(dds))
```

A matrix: 12 × 4 of type dbl

	(Intercept)	assayInput	conditionWT	assayInput:conditionWT
4_7	1	1	0	0
4_7.1	1	0	0	0
4_9	1	1	0	0
4_9.1	1	0	0	0
87	1	1	1	1
87.1	1	0	1	0
90	1	1	1	1
90.1	1	0	1	0
91	1	1	1	1
91.1	1	0	1	0
95_3	1	1	0	0
95_3.1	1	0	0	0