Template Method - Nested Iterators

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Preparation

Load packages

```
library(MplusAutomation)
library(relimp)
library(tidyverse)
library(here)
library(janitor)
library(gt)
```

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0. Write the Mplus `template.txt` file

- This is a special type of Mplus input file that includes the [[/init]] section at the top
- This section of code provides the instructions for doing "iterations" or "loops" to generate multiple input files
- Make sure to **UPDATE** the file-path in the template file so that the input files are generated in the correct location.

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1. Write Mplus input files

```
createModels(here("23-template-method", "PYDI_enumeration_template1.txt"))
```

```
## writing file: C1_PYDI_LCA.inp
## writing file: C2_PYDI_LCA.inp
## writing file: C3_PYDI_LCA.inp
## writing file: C4_PYDI_LCA.inp
```

```
## writing file: C5_PYDI_LCA.inp
## writing file: C6_PYDI_LCA.inp
## writing file: C7_PYDI_LCA.inp
## writing file: C8_PYDI_LCA.inp
```

---

2. Run models

- `recursive = TRUE` tells R to run all models within a parent folder. The recursive option is useful because when generating large batches of input files we can use the template file to create a nested set of sub-folder to organize models by type.

```
runModels(here("23-template-method", "mplus_files"), recursive = TRUE)
```

---

3. Read models

```
output_enum <- readModels(here("23-template-method", "mplus_files"), quiet = TRUE)
```

---

4. Extract fit information from output files

- Any information in the ouptut or .gh5 files can be extracted and organized.
- This includes the summary statistics which are necessary to look at for choosing the number of classes.
- The models can be sorted based on a give statistic, such as the BIC.

```
enum_summary <- LatexSummaryTable(output_enum,
                keepCols=c("Title", "LL", "BIC", "aBIC"),
                sortBy = "Title")

enum_summary %>%
  gt()
```

Title	LL	BIC	aBIC
C1_PYDI_LCA	-3905.892	7863.555	7841.317
C2_PYDI_LCA	-3439.483	6989.902	6942.250
C3_PYDI_LCA	-3394.950	6960.001	6886.934
C4_PYDI_LCA	-3379.436	6988.140	6889.658
C5_PYDI_LCA	-3370.534	7029.501	6905.604
C6_PYDI_LCA	-3365.674	7078.948	6929.637
C7_PYDI_LCA	-3361.597	7129.959	6955.234
C8_PYDI_LCA	-3357.463	7180.857	6980.716

5. Mplus Object lists

- Click on the Mplus object in your R environment. This is an object including nested lists.
- This code tells R to look inside the object `output_enum` and extract the probabilities from the `.gh5` file associated with the 3-class model

```
conditional_probs <- as.data.frame(output_enum[["C3_PYDI_LCA.out"]]
                            [["gh5"]]
                            [["means_and_variances_data"]]
                            [["estimated_probs"]]
                            [["values"]]
                            [seq(2, 14, 2),]) # seq("from","to","by")

conditional_probs %>% gt()
```

V1	V2	V3
0.8205463	0.1732870	0.2748898
0.9877123	0.5810680	0.8469923
0.9621444	0.5305504	0.6980789
1.0000000	0.6431175	0.8178859
0.9918640	0.1466496	0.6845955
0.9936640	0.3763532	0.9552785
0.9949189	0.2167879	0.8959467

End

References

Hallquist, M. N., & Wiley, J. F. (2018). MplusAutomation: An R Package for Facilitating Large-Scale Latent Variable Analyses in Mplus. Structural equation modeling: a multidisciplinary journal, 25(4), 621-638.

Muthén, L. K., & Muthén, B. O. (2002). How to use a Monte Carlo study to decide on sample size and determine power. Structural equation modeling, 9(4), 599-620.

R Core Team (2017). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL http://www.R-project.org/

Wickham et al., (2019). Welcome to the tidyverse. Journal of Open Source Software, 4(43), 1686, https://doi.org/10.21105/joss.01686