Project proposal - Bayesian Analysis

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Ulrik Danielsen (me) and Alexander Ohrt have chosen to model the duration Erasmus+ students study abroad. The data is found at https://data.europa.eu/data/datasets/erasmus-mobility-statistics-2014-2019-v2?locale=en. Included in the data is the countries which the students travel from and to, their age, nationality etc. We expect the data to be a mixture of the people staying for one semester, and the ones staying for one year.

The objective is foremost to create a model which adequately describes the behavior of the duration periods. After that, we could look at behavior in different recieving countries (the semester has different lengths in different countries), or check if age influeses the duration.

Below I include a very brief discriprion of the data.

```
df <- read.csv2("./erasmus2019.csv")
dim(df)
```

```
## [1] 736434     24
```

```
names(df)
```

```
##  [1] "Project.Reference"                "Academic.Year"
##  [3] "Mobility.Start.Month"             "Mobility.End.Month"
##  [5] "Mobility.Duration"                "Activity..mob."
##  [7] "Field.of.Education"               "Participant.Nationality"
##  [9] "Education.Level"                  "Participant.Gender"
## [11] "Participant.Profile"             "Special.Needs"
## [13] "Fewer.Opportunities"             "GroupLeader"
## [15] "Participant.Age"                 "Sending.Country.Code"
## [17] "Sending.City"                    "Sending.Organization"
## [19] "Sending.Organisation.Erasmus.Code" "Receiving.Country.Code"
## [21] "Receiving.City"                   "Receiving.Organization"
## [23] "Receiving.Organisation.Erasmus.Code" "Participants"
```

```
head(df)
```

```
##        Project.Reference Academic.Year Mobility.Start.Month
## 1 2016-3-EE01-KA105-034520     2019-2020              2019-03
## 2 2016-3-UK01-KA105-035288     2019-2020              2019-02
## 3 2017-1-AT01-KA101-034705     2019-2020              2019-04
## 4 2017-1-AT01-KA101-034727     2019-2020              2019-02
## 5 2017-1-AT01-KA101-034774     2019-2020              2019-02
## 6 2017-1-AT01-KA101-034774     2019-2020              2019-02
##   Mobility.End.Month Mobility.Duration
## 1            2019-04        33.0000000
## 2            2019-03        56.0000000
## 3            2019-04         6.0000000
## 4            2019-02        15.0000000
```

```
## 5             2019-02        5.0000000
## 6             2019-02        5.0000000
##                                         Activity..mob.
## 1 European Voluntary Service - Partner Countries
## 2 European Voluntary Service - Partner Countries
## 3          Structured Courses/Training Events
## 4          Structured Courses/Training Events
## 5          Structured Courses/Training Events
## 6          Structured Courses/Training Events
##                          Field.of.Education Participant.Nationality
## 1                            ? Unknown ?                          EE
## 2                            ? Unknown ?                          IT
## 3                              Languages                          AT
## 4 Teacher training with subject specialization                    AT
## 5                              Education                          AT
## 6                              Education                          AT
##      Education.Level Participant.Gender Participant.Profile Special.Needs
## 1 ??? - ? Unknown ?             Female             Learner            No
## 2 ??? - ? Unknown ?               Male             Learner            No
## 3 ??? - ? Unknown ?             Female               Staff            No
## 4 ??? - ? Unknown ?             Female               Staff            No
## 5 ??? - ? Unknown ?             Female               Staff            No
## 6 ??? - ? Unknown ?               Male               Staff            No
##   Fewer.Opportunities GroupLeader Participant.Age Sending.Country.Code
## 1                  No          No              18                   EE
## 2                 Yes          No              29                   IT
## 3                  No          No              39                   AT
## 4                  No          No              27                   AT
## 5                  No          No              26                   AT
## 6                  No          No              28                   AT
##   Sending.City                                      Sending.Organization
## 1     TALLINN           MTÜ NOORTEVAHETUSE ARENGU ÜHING ESTYES
## 2     TRAPPETO                                                    CESIE
## 3   Hollabrunn HTL Für Lebensmitteltechnologie-Lebensmittelsicherheit
## 4         Weiz                                           BHAK/BHAS Weiz
## 5         Linz        Bundesbildungsanstalt für Elementarpädagogik
## 6         Linz        Bundesbildungsanstalt für Elementarpädagogik
##   Sending.Organisation.Erasmus.Code Receiving.Country.Code  Receiving.City
## 1                                 -                     RU Nizhny Novgorod
## 2                                 -                     UK         Cardiff
## 3                                 -                     EL        Heraklion
## 4                                 -                     IE          Dublin
## 5                                 -                     MT      St.Julian's
## 6                                 -                     MT      St.Julian's
##                                          Receiving.Organization
## 1 Interregional youth social movement of support of voluntary initiatives SFERA
## 2                                           Language Academy Wales
## 3        Institut für europäische Lehrerfortbildung UG (haftungsbeschränkt)
## 4                                           Atlantic Language Dublin
## 5                                  Executive Training Institute Ltd.
## 6                                  Executive Training Institute Ltd.
##   Receiving.Organisation.Erasmus.Code Participants
## 1                                   -            1
## 2                                   -            1
```

```
## 3                                              -              1
## 4                                              -              1
## 5                                              -              1
## 6                                              -              1
```