DATA IMPUTATION WITH DEEP-LEARNING MODELS

FINAL PROJECT PRESENTATION

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DATA

Turkish Faith and Religiosity Survey (TFRS) - December 2021 and May 2022
Sample size: 1942

```
   q0001  q0002  q0003  q0004  q0005  q0006  q0007  q0008  q0009  q0010  ...  \
0      2      4     73      1    NaN      1    5.0      5      3      3  ...
1      2      9     73      1    NaN      2    NaN      5      8      9  ...
2      2      8     73      1    NaN      2    NaN      7      1      3  ...
3      1     29     73      2    1.0      2    NaN      7      6      6  ...
4      2     20     40      2    4.0      2    NaN      5      2      2  ...

   dindarR  kirkent  nutstr  basortu  disortu  evortu  ibadetortu  \
0        2        1      11      1.0      1.0     1.0         1.0
1        3        1      11      1.0      1.0     1.0         1.0
2        4        1      11      2.0      1.0     1.0         5.0
3        4        1      11      NaN      NaN     NaN         NaN
4        4        1      12      2.0      5.0     5.0         5.0

   q0050_0016_d  q0050_0005_d  q0050_0001_d
0           NaN           NaN           NaN
1           2.0           NaN           NaN
2           2.0           1.0           2.0
3           1.0           1.0           2.0
4           2.0           2.0           2.0

[5 rows x 241 columns]
```

```python
vars_names = {
    'q0050_0001': 'Müslüman',
    'q0050_0002': 'Ateist',
    'q0050_0003': 'İslamcı',
    'q0050_0004': 'Agnostik',
    'q0050_0005': 'Sünni',
    'q0050_0006': 'Deist',
    'q0050_0007': 'Selefi',
    'q0050_0008': 'Milliyetçi',
    'q0050_0009': 'Laik',
    'q0050_0010': 'Solcu',
    'q0050_0011': 'Hümanist',
    'q0050_0012': 'Atatürkçü',
    'q0050_0013': 'Alevi',
    'q0050_0014': 'Şii',
    'q0050_0015': 'Muhafazakar',
    'q0050_0016': 'Dindar',
    'q0050_0017': 'Seküler',
    'q0050_0018': 'Demokrat',
    'q0050_0019': 'Sosyalist',
    'q0050_0020': 'Feminist',
    'q0050_0021': 'LGBT+ hakları savunucusu',
    'q0050_0022': 'Çevreci',
    'q0050_0023': 'Sağcı',
    'q0050_0005_d': 'Sünni dikotomik',
    'q0050_0001_d': 'Müslüman dikotomik',
    'q0050_0016_d': 'Dindar dikotomik',
}
```

	Eksik Yüzde
Seküler	78.341969
Selefi	76.683938
Agnostik	76.528497
Hümanist	27.875648
Sosyalist	26.787565
LGBT+ hakları savunucusu	26.632124
Sağcı	25.854922
Şii	25.492228
Deist	23.989637
Feminist	23.886010
Sünni dikotomik	23.886010
Sünni	23.886010
Demokrat	23.367876
Solcu	23.264249
Alevi	19.740933
Muhafazakar	19.689119
İslamcı	15.388601
Laik	14.974093
Milliyetçi	14.196891
Çevreci	13.989637
Atatürkçü	11.968912
Ateist	11.450777
Dindar dikotomik	11.295337
Dindar	11.295337
Müslüman	5.284974
Müslüman dikotomik	5.284974

02

LASSO ANALYSIS (ORDINAL)

Optimized sample size: 884

R square: 0.58

MSE: 0.59

```
Lasso Katsayıları
q0001            0.000000
q0002            0.000000
q0003            0.000000
q0004            0.00000
q0006            0.000000
                 ...
q0053_0009       0.000000
q0050_0002      -0.089904
q0050_0003       0.093233
q0050_0008       0.000000
q0050_0009       0.000000
Length: 171, dtype: float64
```

LASSO ile seçilen değişkenler: ['q0020_0002', 'q0020_0005', 'q0021_0005', 'q0023_0001', 'q0026_0004', 'q0031_0016', 'q0035_0003', 'q0037_0006', 'q0039_0001', 'q0039_0003', 'q0039_0004', 'q0039_0005', 'q0039_0006', 'q0047_0001', 'q0052', 'q0050_0002', 'q0050_0003']

Adam optimizer / mse loss

	precision	recall	f1-score	support
1.0	0.00	0.00	0.00	97
2.0	0.00	0.00	0.00	60
3.0	0.00	0.00	0.00	204
4.0	0.00	0.00	0.00	186
5.0	0.70	1.00	0.82	1281
accuracy			0.70	1828
macro avg	0.14	0.20	0.16	1828
weighted avg	0.49	0.70	0.58	1828

04

RMSprop optimizer / categorical_crossentropy loss

	precision	recall	f1-score	support
1	0.00	0.00	0.00	29
2	0.00	0.00	0.00	17
3	0.00	0.00	0.00	64
4	0.00	0.00	0.00	67
5	0.68	1.00	0.81	372
accuracy			0.68	549
macro avg	0.14	0.20	0.16	549
weighted avg	0.46	0.68	0.55	549

05

Adam optimizer / categorical_crossentropy loss

	precision	recall	f1-score	support
1	0.00	0.00	0.00	29
2	0.00	0.00	0.00	17
3	0.00	0.00	0.00	64
4	0.00	0.00	0.00	67
5	0.68	1.00	0.81	372
accuracy			0.68	549
macro avg	0.14	0.20	0.16	549
weighted avg	0.46	0.68	0.55	549

LASSO ANALYSIS (BINARY)

Optimized sample size: 1129

R square: 0.42
MSE: 0.024

LASSO ile seçilen değişkenler: ['q0020_0001', 'q0021_0004', 'q0022_0001', 'q0022_0004', 'q0023_0001', 'q0025_0003', 'q0026_0001', 'q0027_0001', 'q0029_0006', 'q0030_0009', 'q0031_0005', 'q0032_0002', 'q0032_0007', 'q0033_0002', 'q0036_0007', 'q0037_0006', 'q0038_0004', 'q0039_0001', 'q0039_0004', 'q0039_0005', 'q0039_0006', 'q0048_0009', 'q0052'

BİNARY CLASSIFICATION MULTILAYER PERCEPTRON

Adam optimizer / binary_crossentropy loss

	precision	recall	f1-score	support
0	0.00	0.00	0.00	97
1	0.95	1.00	0.97	1731
accuracy			0.95	1828
macro avg	0.47	0.50	0.49	1828
weighted avg	0.90	0.95	0.92	1828

BİNARY CLASSIFICATION MULTILAYER PERCEPTRON

Adam optimizer / mse loss

	precision	recall	f1-score	support
0	0.00	0.00	0.00	97
1	0.95	1.00	0.97	1731
accuracy			0.95	1828
macro avg	0.47	0.50	0.49	1828
weighted avg	0.90	0.95	0.92	1828