# AutoML - HW1

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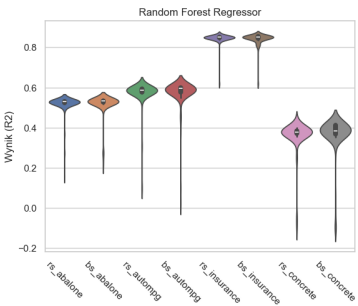
# Wykorzystane zbiory

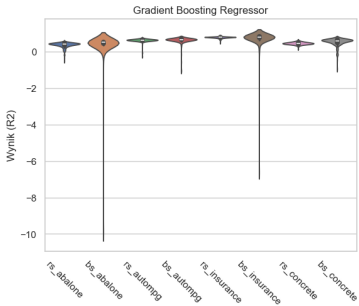
- Abalone (4177 x 9)
- Auto MPG (398 x 9)
- Insurance (1338 x 7)
- Concrete Compressive Strength (1030 x 9)

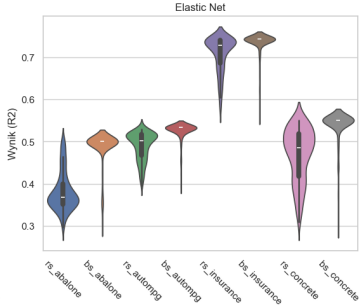
# Modele i trenowane hiperparametry

- Random Forest Regressor
  - n estimators: (1,1000)
  - max depth: (1,100)
  - min samples split: (2,10)
  - min samples leaf: (1,5)
- Elastic Net:
  - alpha: (0,1)
  - l1 ratio: (0,1)
- Gradient Boosting Regressor
  - n estimators: (1,1000)
  - learning rate: (0.01,0.3)
  - subsample: (0.1,1)
  - max depth: (1,100)
  - min samples split: (2,10)
  - min samples leaf: (1,5)

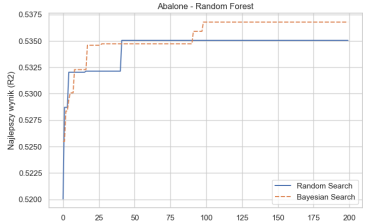
# Rozkład wyników

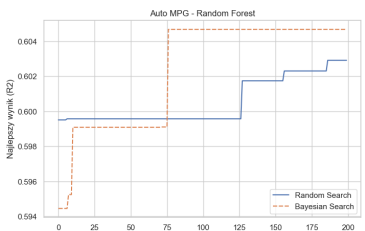


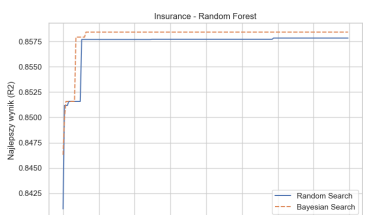



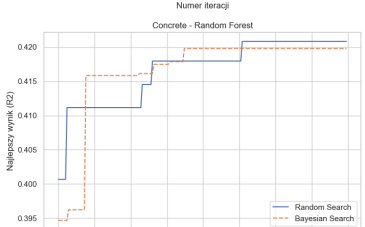



# Zbieżność - Random Forest Regressor

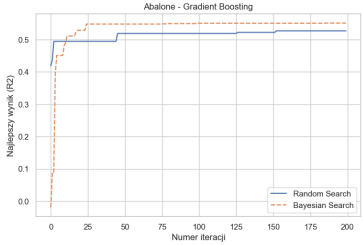


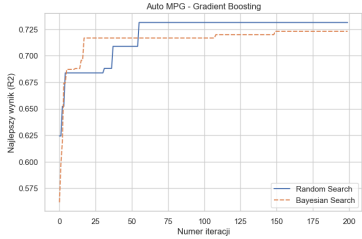



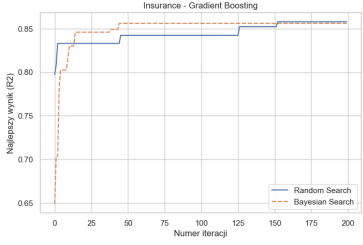



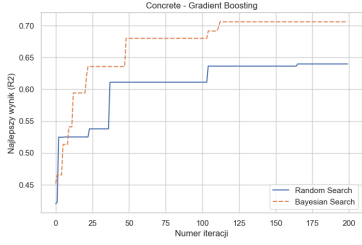



# Zbieżność - Gradient Boosting Regressor

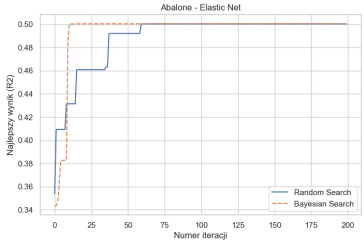


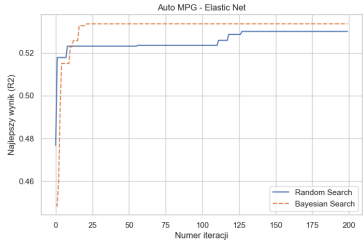



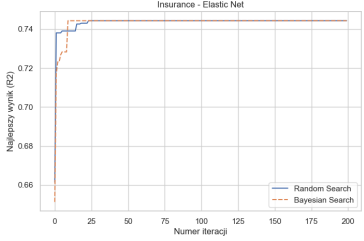



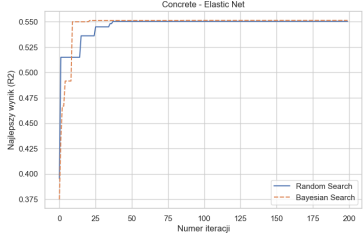



# Zbieżność - Elastic Net



# Najlepsze hiperparametry

| Random Forest Regressor | | | | | |
|---|---|---|---|---|---|
| | | Abalone | Auto MPG | Insurance | Concrete |
| n estimators | R | 967 | 138 | 824 | 90 |
| | B | 441 | 941 | 817 | 150 |
| max depth | R | 8 | 69 | 4 | 15 |
| | B | 27 | 96 | 5 | 63 |
| min samples split | R | 2 | 3 | 5 | 2 |
| | B | 9 | 2 | 6 | 2 |
| min samples leaf | R | 3 | 1 | 4 | 1 |
| | B | 5 | 2 | 4 | 1 |

# Najlepsze hiperparametry

| Gradient Boosting Regressor | | | | | |
|---|---|---|---|---|---|
| | | Abalone | Auto MPG | Insurance | Concrete |
| n estimators | R | 22 | 527 | 22 | 412 |
| | B | 393 | 832 | 217 | 507 |
| learning rate | R | 0.17 | 0.15 | 0.17 | 0.12 |
| | B | 0.01 | 0.01 | 0.01 | 0.24 |
| subsample | R | 0.48 | 0.31 | 0.48 | 0.49 |
| | B | 0.1 | 0.38 | 0.19 | 0.70 |
| max depth | R | 3 | 48 | 3 | 1 |
| | B | 62 | 22 | 51 | 1 |
| min samples split | R | 9 | 7 | 9 | 5 |
| | B | 5 | 10 | 10 | 10 |
| min samples leaf | R | 3 | 3 | 3 | 4 |
| | B | 5 | 1 | 5 | 5 |

# Najlepsze hiperparametry

| Elastic Net | | | | | |
|---|---|---|---|---|---|
| | | Abalone | Auto MPG | Insurance | Concrete |
| alpha | R | 0.0026 | 0.1910 | 0.7049 | 0.0077 |
| | B | 0.0005 | 0.0 | 0.0827 | 0.1308 |
| l1 ratio | R | 0.98 | 0.96 | 0.99 | 0.08 |
| | B | 0.01 | 0.0 | 0.95 | 1.0 |

# Średnio najlepsze hiperparametry

Random Forest Regressor:

- n estimators: 90
- max depth: 15
- min samples split: 2
- min samples leaf: 1

Miejsce dla zbioru:

- Abalone: 178
- Autompg: 3
- Insurance: 192
- Concrete: 1

Gradient Boosting Regressor:

- learning rate: 0.0110
- subsample: 0.27
- n estimators: 839
- max depth: 65
- min samples split: 9
- min samples leaf: 2

Miejsce dla zbioru:

- Abalone: 6
- Autompg: 6
- Insurance: 6
- Concrete: 10

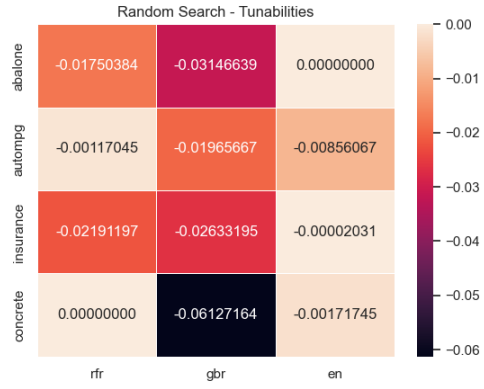
Elastic Net:

- alpha: 0.0026
- l1 ratio: 0.988

Miejsce dla zbioru:

- Abalone: 1
- Autompg: 17
- Insurance: 14
- Concrete: 12

# Tunowalność

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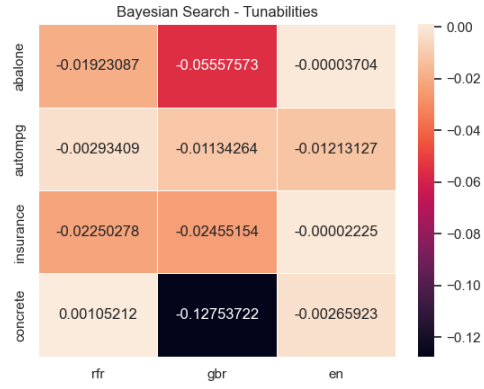


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