|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variable to predict | Algorithm | **Explained variance score** | **Max error** | **MAE** | **MSE** | **MAPE (%)** |
| Steel - Total mass (optimised) structural steel frame | RF with 100 trees | 0.992 | 477.896 | 43.792 | 4582.268 | 0.045 |
| RF with 10 trees | 0.991 | 478.401 | 48.425 | 5541.065 | 0.050 |
| SVR | 0.962 | 1127.663 | 100.176 | 25380.051 | 19.988 |
| ANN | 0.984 | 758.359 | 70.387 | 10277.093 | 10.269 |
| Steel - Total mass (rationalised) structural steel frame | RF with 100 trees | 0.989 | 637.822 | 61.953 | 9079.218 | 0.056 |
| RF with 10 trees | 0.987 | 678.829 | 68.184 | 10886.473 | 0.061 |
| SVR | 0.959 | 1379.723 | 119.619 | 36454.134 | 21.494 |
| ANN | 0.983 | 941.553 | 85.290 | 14910.190 | 10.944 |
| Concrete - Total mass (optimised) Columns | RF with 100 trees | 0.996 | 185.823 | 10.917 | 390.042 | 0.031 |
| RF with 10 trees | 0.996 | 158.153 | 12.014 | 421.299 | 0.033 |
| SVR | 0.947 | 496.578 | 56.204 | 6847.445 | 59.350 |
| ANN | 0.983 | 335.847 | 27.458 | 2090.301 | 13.509 |
| Concrete – Total mass (rationalised) Columns | RF with 100 trees | 0.996 | 342.129 | 18.807 | 1207.267 | 0.032 |
| RF with 10 trees | 0.996 | 294.767 | 20.592 | 1324.500 | 0.035 |
| SVR | 0.937 | 899.821 | 108.288 | 25408.120 | 108.056 |
| ANN | 0.980 | 599.905 | 51.222 | 7172.938 | 16.520 |
| Concrete - Total mass Concrete floors (beams + slabs) | RF with 100 trees | 0.998 | 1881.273 | 110.629 | 34206.441 | 0.017 |
| RF with 10 trees | 0.998 | 2120.939 | 106.811 | 35108.355 | 0.017 |
| SVR | 0.944 | 6719.737 | 877.729 | 1865801.398 | 16.693 |
| ANN | 0.963 | 4485.873 | 683.064 | 878254.628 | 16.113 |
| Concrete - Total mass (optimised) Concrete frame | RF with 100 trees | 0.998 | 1951.626 | 111.496 | 36162.008 | 0.016 |
| RF with 10 trees | 0.998 | 2167.989 | 124.618 | 44196.267 | 0.018 |
| SVR | 0.949 | 7041.614 | 894.409 | 1969712.138 | 16.099 |
| ANN | 0.970 | 4661.709 | 646.090 | 820866.796 | 14.115 |
| Concrete - Total mass (rationalised) Concrete  frame | RF | 0.998 | 2167.369 | 125.520 | 45586.204 | 0.018 |
| RF with 10 trees | 0.998 | 2644.495 | 140.234 | 57049.505 | 0.020 |
| SVR | 0.946 | 7713.699 | 957.098 | 2304069.514 | 16.499 |
| ANN | 0.969 | 4845.086 | 683.664 | 915875.463 | 15.022 |
| Glulam - Total mass (rationalised) Columns 2 | RF | 0.995 | 49.975 | 4.045 | 46.438 | 0.048 |
| RF with 10 trees | 0.993 | 51.894 | 4.549 | 58.778 | 0.053 |
| SVR | 0.882 | 223.453 | 21.941 | 1264.865 | 117.735 |
| ANN | 0.993 | 69.383 | 5.234 | 66.776 | 22.484 |
| Glulam - Total mass timber floors (Glulam beams + CLT slabs) | RF | 0.998 | 248.613 | 22.050 | 1187.803 | 0.018 |
| RF with 10 trees | 0.998 | 263.708 | 25.126 | 1511.037 | 0.020 |
| SVR | 0.992 | 455.570 | 51.958 | 6020.717 | 8.667 |
| ANN | 0.993 | 404.420 | 57.673 | 5963.047 | 7.862 |
| Glulam - Total mass (rationalised) Timber  frame | RF | 0.998 | 292.913 | 27.889 | 1871.266 | 0.021 |
| RF with 10 trees | 0.997 | 317.968 | 31.339 | 2278.514 | 0.023 |
| SVR | 0.988 | 677.780 | 70.612 | 12221.917 | 11.184 |
| ANN | 0.992 | 508.001 | 64.242 | 7706.541 | 8.294 |
| Glulam - Total mass (rationalised) Columns plus Beams | RF | 0.993 | 261.295 | 23.115 | 1320.676 | 0.040 |
| RF with 10 trees | 0.992 | 275.947 | 26.381 | 1646.988 | 0.046 |
| SVR | 0.960 | 581.844 | 61.648 | 8895.508 | 22.457 |
| ANN | 0.989 | 329.806 | 34.646 | 2420.057 | 8.588 |