# دراسة حالة على التحليل التمييزي iscriminant Analysis

يمثل البيانات خاصة بمبيعات السيارات Car Sales ، وهو عبارة عن مبيعات sales بالألف دولار وإعادة المبيعات خلال أربع سنوات، ونوع السيارات (يدوي (0)، أوتوماتيك(1))، وسعر السيارة.

**المطلوب**: إجراء دالة التحليل التمييزي بناء على المتغير type : نوع السيارة

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **manufact** | **model** | **sales** | **resale** | **type** | **price** |
| Acura | Integra | 16.919 | 16.36 | 0 | 21.5 |
| Acura | TL | 39.384 | 19.875 | 0 | 28.4 |
| Acura | CL | 14.114 | 18.225 | 0 |  |
| Acura | RL | 8.588 | 29.725 | 0 | 42 |
| Audi | A4 | 20.397 | 22.255 | 0 | 23.99 |
| Audi | A6 | 18.78 | 23.555 | 0 | 33.95 |
| Audi | A8 | 1.38 | 39 | 0 | 62 |
| BMW | 323i | 19.747 |  | 0 | 26.99 |
| BMW | 328i | 9.231 | 28.675 | 0 | 33.4 |
| BMW | 528i | 17.527 | 36.125 | 0 | 38.9 |
| Buick | Century | 91.561 | 12.475 | 0 | 21.975 |
| Buick | Regal | 39.35 | 13.74 | 0 | 25.3 |
| Buick | Park Avenue | 27.851 | 20.19 | 0 | 31.965 |
| Buick | LeSabre | 83.257 | 13.36 | 0 | 27.885 |
| Cadillac | DeVille | 63.729 | 22.525 | 0 | 39.895 |
| Cadillac | Seville | 15.943 | 27.1 | 0 | 44.475 |
| Cadillac | Eldorado | 6.536 | 25.725 | 0 | 39.665 |
| Cadillac | Catera | 11.185 | 18.225 | 0 | 31.01 |
| Cadillac | Escalade | 14.785 |  | 1 | 46.225 |
| Chevrolet | Cavalier | 145.519 | 9.25 | 0 | 13.26 |
| Chevrolet | Malibu | 135.126 | 11.225 | 0 | 16.535 |
| Chevrolet | Lumina | 24.629 | 10.31 | 0 | 18.89 |
| Chevrolet | Monte Carlo | 42.593 | 11.525 | 0 | 19.39 |
| Chevrolet | Camaro | 26.402 | 13.025 | 0 | 24.34 |
| Chevrolet | Corvette | 17.947 | 36.225 | 0 | 45.705 |
| Chevrolet | Prizm | 32.299 | 9.125 | 0 | 13.96 |
| Chevrolet | Metro | 21.855 | 5.16 | 0 | 9.235 |
| Chevrolet | Impala | 107.995 |  | 0 | 18.89 |
| Chrysler | Sebring Coupe | 7.854 | 12.36 | 0 | 19.84 |
| Chrysler | Sebring Conv. | 32.775 | 14.18 | 0 | 24.495 |
| Chrysler | Concorde | 31.148 | 13.725 | 0 | 22.245 |
| Chrysler | Cirrus | 32.306 | 12.64 | 0 | 16.48 |
| Chrysler | LHS | 13.462 | 17.325 | 0 | 28.34 |
| Chrysler | Town & Country | 53.48 | 19.54 | 1 |  |
| Chrysler | 300M | 30.696 |  | 0 | 29.185 |
| Dodge | Neon | 76.034 | 7.75 | 0 | 12.64 |
| Dodge | Avenger | 4.734 | 12.545 | 0 | 19.045 |
| Dodge | Stratus | 71.186 | 10.185 | 0 | 20.23 |
| Dodge | Intrepid | 88.028 | 12.275 | 0 | 22.505 |
| Dodge | Viper | 0.916 | 58.47 | 0 | 69.725 |
| Dodge | Ram Pickup | 227.061 | 15.06 | 1 | 19.46 |
| Dodge | Ram Wagon | 16.767 | 15.51 | 1 | 21.315 |
| Dodge | Ram Van | 31.038 | 13.425 | 1 | 18.575 |
| Dodge | Dakota | 111.313 | 11.26 | 1 | 16.98 |
| Dodge | Durango | 101.323 |  | 1 | 26.31 |
| Dodge | Caravan | 181.749 | 12.025 | 1 | 19.565 |
| Ford | Escort | 70.227 | 7.425 | 0 | 12.07 |
| Ford | Mustang | 113.369 | 12.76 | 0 | 21.56 |
| Ford | Contour | 35.068 | 8.835 | 0 | 17.035 |
| Ford | Taurus | 245.815 | 10.055 | 0 | 17.885 |
| Ford | Focus | 175.67 |  | 0 | 12.315 |
| Ford | Crown Victoria | 63.403 | 14.21 | 0 | 22.195 |
| Ford | Explorer | 276.747 | 16.64 | 1 | 31.93 |
| Ford | Windstar | 155.787 | 13.175 | 1 | 21.41 |
| Ford | Expedition | 125.338 | 23.575 | 1 | 36.135 |
| Ford | Ranger | 220.65 | 7.85 | 1 | 12.05 |
| Ford | F-Series | 540.561 | 15.075 | 1 | 26.935 |
| Honda | Civic | 199.685 | 9.85 | 0 | 12.885 |
| Honda | Accord | 230.902 | 13.21 | 0 | 15.35 |
| Honda | CR-V | 73.203 | 17.71 | 1 | 20.55 |
| Honda | Passport | 12.855 | 17.525 | 1 | 26.6 |
| Honda | Odyssey | 76.029 | 19.49 | 1 | 26 |
| Hyundai | Accent | 41.184 | 5.86 | 0 | 9.699 |
| Hyundai | Elantra | 66.692 | 7.825 | 0 | 11.799 |
| Hyundai | Sonata | 29.45 | 8.91 | 0 | 14.999 |
| Infiniti | I30 | 23.713 | 19.69 | 0 | 29.465 |
| Jaguar | S-Type | 15.467 |  | 0 | 42.8 |
| Jeep | Wrangler | 55.557 | 13.475 | 1 | 14.46 |
| Jeep | Cherokee | 80.556 | 13.775 | 1 | 21.62 |
| Jeep | Grand Cherokee | 157.04 | 18.81 | 1 | 26.895 |
| Lexus | ES300 | 24.072 | 26.975 | 0 | 31.505 |
| Lexus | GS300 | 12.698 | 32.075 | 0 | 37.805 |
| Lexus | GS400 | 3.334 |  | 0 | 46.305 |
| Lexus | LS400 | 6.375 | 40.375 | 0 | 54.005 |
| Lexus | LX470 | 9.126 |  | 1 | 60.105 |
| Lexus | RX300 | 51.238 |  | 1 | 34.605 |
| Lincoln | Continental | 13.798 | 20.525 | 0 | 39.08 |
| Lincoln | Town car | 48.911 | 21.725 | 0 | 43.33 |
| Lincoln | Navigator | 22.925 |  | 1 | 42.66 |
| Mitsubishi | Mirage | 26.232 | 8.325 | 0 | 13.987 |
| Mitsubishi | Eclipse | 42.541 | 10.395 | 0 | 19.047 |
| Mitsubishi | Galant | 55.616 | 10.595 | 0 | 17.357 |
| Mitsubishi | Diamante | 5.711 | 16.575 | 0 | 24.997 |
| Mitsubishi | 3000GT | 0.11 | 20.94 | 0 | 25.45 |
| Mitsubishi | Montero | 11.337 | 19.125 | 1 | 31.807 |
| Mitsubishi | Montero Sport | 39.348 | 13.88 | 1 | 22.527 |
| Mercury | Mystique | 14.351 | 8.8 | 0 | 16.24 |
| Mercury | Cougar | 26.529 | 13.89 | 0 | 16.54 |
| Mercury | Sable | 67.956 | 11.03 | 0 | 19.035 |
| Mercury | Grand Marquis | 81.174 | 14.875 | 0 | 22.605 |
| Mercury | Mountaineer | 27.609 | 20.43 | 1 | 27.56 |
| Mercury | Villager | 20.38 | 14.795 | 1 | 22.51 |
| Mercedes-Benz | C-Class | 18.392 | 26.05 | 0 | 31.75 |
| Mercedes-Benz | E-Class | 27.602 | 41.45 | 0 | 49.9 |
| Mercedes-Benz | S-Class | 16.774 | 50.375 | 0 | 69.7 |
| Mercedes-Benz | SL-Class | 3.311 | 58.6 | 0 | 82.6 |
| Mercedes-Benz | SLK | 7.998 |  | 0 | 38.9 |
| Mercedes-Benz | SLK230 | 1.526 |  | 0 | 41 |
| Mercedes-Benz | CLK Coupe | 11.592 |  | 0 | 41.6 |
| Mercedes-Benz | CL500 | 0.954 |  | 0 | 85.5 |
| Mercedes-Benz | M-Class | 28.976 |  | 1 | 35.3 |
| Nissan | Sentra | 42.643 | 8.45 | 0 | 13.499 |
| Nissan | Altima | 88.094 | 11.295 | 0 | 20.39 |
| Nissan | Maxima | 79.853 | 15.125 | 0 | 26.249 |
| Nissan | Quest | 27.308 | 15.38 | 1 | 26.399 |
| Nissan | Pathfinder | 42.574 | 17.81 | 1 | 29.299 |
| Nissan | Xterra | 54.158 |  | 1 | 22.799 |
| Nissan | Frontier | 65.005 |  | 1 | 17.89 |
| Oldsmobile | Cutlass | 1.112 | 11.24 | 0 | 18.145 |
| Oldsmobile | Intrigue | 38.554 |  | 0 | 24.15 |
| Oldsmobile | Alero | 80.255 |  | 0 | 18.27 |
| Oldsmobile | Aurora | 14.69 | 19.89 | 0 | 36.229 |
| Oldsmobile | Bravada | 20.017 | 19.925 | 1 | 31.598 |
| Oldsmobile | Silhouette | 24.361 | 15.24 | 1 | 25.345 |
| Plymouth | Neon | 32.734 | 7.75 | 0 | 12.64 |
| Plymouth | Breeze | 5.24 | 9.8 | 0 | 16.08 |
| Plymouth | Voyager | 24.155 | 12.025 | 1 | 18.85 |
| Plymouth | Prowler | 1.872 |  | 0 | 43 |
| Pontiac | Sunfire | 51.645 | 13.79 | 0 | 21.61 |
| Pontiac | Grand Am | 131.097 | 10.29 | 0 | 19.72 |
| Pontiac | Firebird | 19.911 | 17.805 | 0 | 25.31 |
| Pontiac | Grand Prix | 92.364 | 14.01 | 0 | 21.665 |
| Pontiac | Bonneville | 35.945 | 13.225 | 0 | 23.755 |
| Pontiac | Montana | 39.572 |  | 1 | 25.635 |
| Porsche | Boxter | 8.982 | 41.25 | 0 | 41.43 |
| Porsche | Carrera Coupe | 1.28 | 60.625 | 0 | 71.02 |
| Porsche | Carrera Cabriolet | 1.866 | 67.55 | 0 | 74.97 |
| Saab | 09-مايو | 9.191 |  | 0 | 33.12 |
| Saab | 09-مارس | 12.115 |  | 0 | 26.1 |
| Saturn | SL | 80.62 | 9.2 | 0 | 10.685 |
| Saturn | SC | 24.546 | 10.59 | 0 | 12.535 |
| Saturn | SW | 5.223 | 10.79 | 0 | 14.29 |
| Saturn | LW | 8.472 |  | 0 | 18.835 |
| Saturn | LS | 49.989 |  | 0 | 15.01 |
| Subaru | Outback | 47.107 |  | 0 | 22.695 |
| Subaru | Forester | 33.028 |  | 1 | 20.095 |
| Toyota | Corolla | 142.535 | 10.025 | 0 | 13.108 |
| Toyota | Camry | 247.994 | 13.245 | 0 | 17.518 |
| Toyota | Avalon | 63.849 | 18.14 | 0 | 25.545 |
| Toyota | Celica | 33.269 | 15.445 | 0 | 16.875 |
| Toyota | Tacoma | 84.087 | 9.575 | 1 | 11.528 |
| Toyota | Sienna | 65.119 |  | 1 | 22.368 |
| Toyota | RAV4 | 25.106 | 13.325 | 1 | 16.888 |
| Toyota | 4Runner | 68.411 | 19.425 | 1 | 22.288 |
| Toyota | Land Cruiser | 9.835 | 34.08 | 1 | 51.728 |
| Volkswagen | Golf | 9.761 | 11.425 | 0 | 14.9 |
| Volkswagen | Jetta | 83.721 | 13.24 | 0 | 16.7 |
| Volkswagen | Passat | 51.102 | 16.725 | 0 | 21.2 |
| Volkswagen | Cabrio | 9.569 | 16.575 | 0 | 19.99 |
| Volkswagen | GTI | 5.596 | 13.76 | 0 | 17.5 |
| Volkswagen | Beetle | 49.463 |  | 0 | 15.9 |
| Volvo | S40 | 16.957 |  | 0 | 23.4 |
| Volvo | V40 | 3.545 |  | 0 | 24.4 |
| Volvo | S70 | 15.245 |  | 0 | 27.5 |
| Volvo | V70 | 17.531 |  | 0 | 28.8 |
| Volvo | C70 | 3.493 |  | 0 | 45.5 |
| Volvo | S80 | 18.969 |  | 0 | 36 |