|  |
| --- |
| > library(faraway)  > library(psych)  > library(QuantPsyc)  > library(MASS)  >  > hw13 <- meatspec  > hw13 <- data.frame(hw13)  > describe(hw13)  vars n mean sd median trimmed mad min max range skew kurtosis se  V1 1 215 2.81 0.41 2.75 2.78 0.37 2.07 4.24 2.17 0.87 0.82 0.03  V2 2 215 2.81 0.41 2.76 2.78 0.37 2.07 4.25 2.18 0.87 0.81 0.03  V3 3 215 2.81 0.42 2.76 2.78 0.37 2.07 4.26 2.19 0.87 0.79 0.03  V4 4 215 2.82 0.42 2.76 2.78 0.38 2.06 4.27 2.20 0.86 0.78 0.03  V5 5 215 2.82 0.42 2.76 2.79 0.38 2.06 4.28 2.21 0.86 0.77 0.03  V6 6 215 2.82 0.42 2.76 2.79 0.38 2.06 4.29 2.23 0.86 0.76 0.03  V7 7 215 2.83 0.43 2.76 2.79 0.39 2.06 4.30 2.24 0.86 0.75 0.03  V8 8 215 2.83 0.43 2.77 2.79 0.39 2.06 4.31 2.25 0.86 0.74 0.03  V9 9 215 2.83 0.43 2.77 2.80 0.39 2.06 4.33 2.26 0.86 0.73 0.03  V10 10 215 2.84 0.43 2.77 2.80 0.40 2.06 4.34 2.28 0.86 0.72 0.03  V11 11 215 2.84 0.44 2.77 2.80 0.40 2.06 4.35 2.29 0.85 0.72 0.03  V12 12 215 2.84 0.44 2.78 2.81 0.40 2.06 4.37 2.30 0.85 0.71 0.03  V13 13 215 2.85 0.44 2.78 2.81 0.41 2.06 4.38 2.32 0.85 0.71 0.03  V14 14 215 2.85 0.45 2.79 2.82 0.41 2.06 4.40 2.34 0.85 0.70 0.03  V15 15 215 2.86 0.45 2.79 2.82 0.41 2.07 4.42 2.35 0.85 0.70 0.03  V16 16 215 2.87 0.45 2.80 2.83 0.41 2.07 4.44 2.37 0.85 0.70 0.03  V17 17 215 2.87 0.45 2.80 2.84 0.42 2.07 4.46 2.39 0.85 0.70 0.03  V18 18 215 2.88 0.46 2.80 2.84 0.42 2.07 4.48 2.41 0.84 0.70 0.03  V19 19 215 2.89 0.46 2.81 2.85 0.42 2.07 4.50 2.43 0.84 0.70 0.03  V20 20 215 2.89 0.46 2.82 2.86 0.43 2.07 4.53 2.46 0.84 0.70 0.03  V21 21 215 2.90 0.47 2.83 2.87 0.43 2.07 4.55 2.48 0.84 0.70 0.03  V22 22 215 2.91 0.47 2.84 2.87 0.43 2.08 4.58 2.50 0.84 0.70 0.03  V23 23 215 2.92 0.47 2.85 2.88 0.43 2.08 4.61 2.53 0.84 0.70 0.03  V24 24 215 2.93 0.48 2.86 2.89 0.43 2.08 4.63 2.55 0.84 0.70 0.03  V25 25 215 2.94 0.48 2.86 2.90 0.43 2.08 4.65 2.57 0.84 0.71 0.03  V26 26 215 2.94 0.48 2.86 2.90 0.44 2.09 4.68 2.59 0.84 0.71 0.03  V27 27 215 2.95 0.49 2.87 2.91 0.44 2.09 4.70 2.61 0.84 0.71 0.03  V28 28 215 2.96 0.49 2.88 2.92 0.44 2.09 4.73 2.63 0.83 0.71 0.03  V29 29 215 2.97 0.50 2.89 2.93 0.45 2.09 4.75 2.66 0.83 0.72 0.03  V30 30 215 2.98 0.50 2.90 2.94 0.45 2.09 4.79 2.69 0.83 0.72 0.03  V31 31 215 2.99 0.50 2.90 2.95 0.46 2.10 4.83 2.73 0.83 0.73 0.03  V32 32 215 3.00 0.51 2.92 2.96 0.47 2.10 4.86 2.77 0.83 0.74 0.03  V33 33 215 3.01 0.51 2.92 2.97 0.47 2.10 4.90 2.80 0.83 0.74 0.04  V34 34 215 3.02 0.52 2.93 2.98 0.48 2.10 4.94 2.84 0.83 0.75 0.04  V35 35 215 3.03 0.52 2.94 2.99 0.48 2.11 4.98 2.87 0.83 0.75 0.04  V36 36 215 3.05 0.53 2.96 3.01 0.49 2.11 5.01 2.90 0.83 0.76 0.04  V37 37 215 3.06 0.53 2.97 3.02 0.49 2.12 5.05 2.93 0.83 0.76 0.04  V38 38 215 3.08 0.54 2.98 3.04 0.49 2.13 5.09 2.96 0.83 0.76 0.04  V39 39 215 3.10 0.54 3.00 3.05 0.49 2.14 5.12 2.98 0.83 0.77 0.04  V40 40 215 3.11 0.54 3.02 3.07 0.49 2.15 5.15 3.00 0.83 0.77 0.04  V41 41 215 3.13 0.55 3.04 3.09 0.50 2.17 5.18 3.01 0.83 0.77 0.04  V42 42 215 3.15 0.55 3.05 3.10 0.51 2.18 5.19 3.00 0.84 0.77 0.04  V43 43 215 3.16 0.55 3.06 3.12 0.50 2.20 5.19 2.98 0.84 0.76 0.04  V44 44 215 3.17 0.54 3.07 3.13 0.50 2.22 5.17 2.95 0.85 0.76 0.04  V45 45 215 3.18 0.54 3.08 3.14 0.49 2.24 5.15 2.91 0.86 0.76 0.04  V46 46 215 3.20 0.53 3.10 3.15 0.49 2.27 5.13 2.87 0.87 0.76 0.04  V47 47 215 3.21 0.53 3.11 3.17 0.49 2.29 5.12 2.82 0.88 0.77 0.04  V48 48 215 3.23 0.53 3.13 3.18 0.49 2.32 5.11 2.79 0.89 0.77 0.04  V49 49 215 3.25 0.53 3.16 3.21 0.48 2.35 5.12 2.76 0.90 0.78 0.04  V50 50 215 3.29 0.53 3.19 3.24 0.48 2.39 5.14 2.74 0.91 0.80 0.04  V51 51 215 3.32 0.53 3.23 3.28 0.49 2.43 5.17 2.73 0.92 0.82 0.04  V52 52 215 3.37 0.53 3.28 3.32 0.48 2.48 5.21 2.73 0.94 0.84 0.04  V53 53 215 3.41 0.53 3.33 3.37 0.47 2.53 5.25 2.73 0.95 0.87 0.04  V54 54 215 3.46 0.53 3.38 3.41 0.47 2.57 5.30 2.73 0.96 0.90 0.04  V55 55 215 3.51 0.53 3.42 3.46 0.46 2.61 5.34 2.73 0.97 0.92 0.04  V56 56 215 3.54 0.54 3.47 3.49 0.46 2.65 5.38 2.73 0.98 0.94 0.04  V57 57 215 3.57 0.54 3.50 3.52 0.47 2.67 5.41 2.74 0.98 0.95 0.04  V58 58 215 3.59 0.54 3.53 3.54 0.49 2.69 5.43 2.74 0.99 0.95 0.04  V59 59 215 3.60 0.54 3.54 3.55 0.49 2.71 5.45 2.74 0.99 0.95 0.04  V60 60 215 3.61 0.54 3.54 3.56 0.49 2.72 5.45 2.74 0.99 0.95 0.04  V61 61 215 3.62 0.54 3.55 3.57 0.49 2.72 5.46 2.74 0.99 0.95 0.04  V62 62 215 3.62 0.54 3.56 3.57 0.48 2.73 5.47 2.74 0.99 0.95 0.04  V63 63 215 3.62 0.54 3.56 3.57 0.48 2.73 5.47 2.74 0.99 0.95 0.04  V64 64 215 3.62 0.55 3.56 3.57 0.48 2.73 5.47 2.74 1.00 0.95 0.04  V65 65 215 3.62 0.55 3.55 3.57 0.48 2.73 5.47 2.74 1.00 0.95 0.04  V66 66 215 3.62 0.55 3.55 3.56 0.48 2.73 5.47 2.74 1.00 0.95 0.04  V67 67 215 3.61 0.55 3.54 3.56 0.48 2.73 5.47 2.74 1.00 0.94 0.04  V68 68 215 3.61 0.55 3.53 3.55 0.49 2.72 5.46 2.73 1.00 0.94 0.04  V69 69 215 3.60 0.55 3.52 3.54 0.48 2.72 5.45 2.73 1.00 0.93 0.04  V70 70 215 3.59 0.55 3.51 3.53 0.48 2.71 5.44 2.73 0.99 0.93 0.04  V71 71 215 3.57 0.55 3.50 3.52 0.48 2.70 5.43 2.73 0.99 0.92 0.04  V72 72 215 3.56 0.55 3.49 3.51 0.48 2.69 5.42 2.73 0.99 0.91 0.04  V73 73 215 3.55 0.55 3.48 3.49 0.48 2.68 5.41 2.73 0.99 0.90 0.04  V74 74 215 3.53 0.55 3.46 3.48 0.49 2.66 5.40 2.73 0.99 0.90 0.04  V75 75 215 3.51 0.54 3.45 3.46 0.49 2.65 5.38 2.74 0.98 0.89 0.04  V76 76 215 3.50 0.54 3.43 3.44 0.50 2.63 5.37 2.74 0.98 0.88 0.04  [ reached 'max' / getOption("max.print") -- omitted 25 rows ]  >  > lmod <- lm(fat ~ .,data=hw13)  > summary(lmod)  Call:  lm(formula = fat ~ ., data = hw13)  Residuals:  Min 1Q Median 3Q Max  -2.9833 -0.4982 0.0135 0.4864 3.1727  Coefficients:  Estimate Std. Error t value Pr(>|t|)  (Intercept) 7.302 1.876 3.892 0.000168 \*\*\*  V1 10898.047 3003.614 3.628 0.000428 \*\*\*  V2 -12174.864 5520.233 -2.205 0.029426 \*  V3 -5953.285 8868.517 -0.671 0.503398  V4 23229.862 15426.530 1.506 0.134875  V5 -28386.219 19758.501 -1.437 0.153554  V6 12748.270 17381.421 0.733 0.464794  V7 -11422.335 11454.169 -0.997 0.320769  V8 7102.332 7123.935 0.997 0.320892  V9 783.655 5228.808 0.150 0.881130  V10 3512.239 6787.803 0.517 0.605856  V11 -10547.574 10580.407 -0.997 0.320926  V12 34638.288 18344.772 1.888 0.061543 .  V13 -38705.447 23098.395 -1.676 0.096542 .  V14 28895.947 19952.355 1.448 0.150293  V15 -13726.347 13312.307 -1.031 0.304676  V16 -7062.769 8172.878 -0.864 0.389308  V17 2571.597 6279.661 0.410 0.682932  V18 5263.427 6183.397 0.851 0.396432  V19 8860.827 8925.154 0.993 0.322914  V20 -12149.937 15184.189 -0.800 0.425276  V21 -19284.872 20536.132 -0.939 0.349680  V22 36626.953 22847.592 1.603 0.111680  V23 -11165.390 19302.712 -0.578 0.564111  V24 -15008.939 13616.072 -1.102 0.272655  V25 16698.992 8582.462 1.946 0.054151 .  V26 -4891.852 5901.456 -0.829 0.408880  V27 -6334.752 6072.685 -1.043 0.299084  V28 24043.786 8144.906 2.952 0.003834 \*\*  V29 -39940.900 12335.575 -3.238 0.001578 \*\*  V30 33309.092 17674.622 1.885 0.062034 .  V31 -23174.509 20974.708 -1.105 0.271539  V32 18764.305 18959.821 0.990 0.324423  V33 -3747.892 13458.994 -0.278 0.781158  V34 -6671.747 9353.448 -0.713 0.477122  V35 -5318.549 7534.861 -0.706 0.481716  V36 10488.898 5773.159 1.817 0.071869 .  V37 -8410.539 5892.265 -1.427 0.156202  V38 -408.228 7970.269 -0.051 0.959241  V39 19815.971 11338.219 1.748 0.083206 .  V40 -23690.179 15971.026 -1.483 0.140748  V41 29398.659 19340.032 1.520 0.131256  V42 -32055.252 20639.448 -1.553 0.123170  V43 11826.000 17491.895 0.676 0.500356  V44 -9994.257 11435.392 -0.874 0.383969  V45 23017.798 8927.175 2.578 0.011200 \*  V46 -9041.633 6218.630 -1.454 0.148705  V47 -4846.799 3520.124 -1.377 0.171246  V48 1536.042 4401.789 0.349 0.727764  V49 2188.418 7363.225 0.297 0.766848  V50 -13170.870 9829.843 -1.340 0.182947  V51 26420.737 13371.372 1.976 0.050580 .  V52 -23565.834 16339.395 -1.442 0.151968  V53 -2005.210 16742.496 -0.120 0.904878  V54 30327.413 14023.378 2.163 0.032658 \*  V55 -31802.344 10650.780 -2.986 0.003461 \*\*  V56 12428.271 6395.916 1.943 0.054463 .  V57 -102.107 4676.993 -0.022 0.982620  V58 210.251 4388.133 0.048 0.961869  V59 -7679.011 4511.526 -1.702 0.091465 .  V60 11590.949 3967.244 2.922 0.004199 \*\*  V61 -6559.639 3756.703 -1.746 0.083485 .  V62 2533.819 3939.248 0.643 0.521370  V63 11950.924 5296.267 2.256 0.025947 \*  V64 -18515.851 7070.171 -2.619 0.010021 \*  V65 4051.697 8539.248 0.474 0.636066  V66 222.861 9691.472 0.023 0.981694  V67 10439.030 10111.231 1.032 0.304061  V68 -22570.742 9493.417 -2.378 0.019094 \*  V69 17285.149 8168.742 2.116 0.036520 \*  V70 -45.036 7357.838 -0.006 0.995127  V71 -8134.714 6796.093 -1.197 0.233802  V72 -1768.780 6344.295 -0.279 0.780905  V73 15744.948 5531.706 2.846 0.005246 \*\*  V74 -11219.545 5666.910 -1.980 0.050132 .  V75 5289.427 5067.718 1.044 0.298810  V76 -2454.612 4760.274 -0.516 0.607101  V77 740.608 4922.688 0.150 0.880677  V78 -5730.806 5518.607 -1.038 0.301257  V79 12166.493 6026.835 2.019 0.045863 \*  V80 -22688.979 7023.823 -3.230 0.001616 \*\*  V81 14991.763 8595.338 1.744 0.083824 .  V82 3331.367 9984.910 0.334 0.739264  V83 -6651.082 11358.746 -0.586 0.559337  V84 -6752.949 12405.922 -0.544 0.587276  V85 16271.066 12434.546 1.309 0.193323  V86 5512.031 13689.180 0.403 0.687955  V87 -21092.220 15770.171 -1.337 0.183730  V88 9657.690 15143.593 0.638 0.524921  V89 273.586 13103.448 0.021 0.983379  V90 -5489.915 13927.199 -0.394 0.694180  V91 2891.941 15479.740 0.187 0.852133  V92 10160.850 14407.777 0.705 0.482103  V93 -3183.235 11882.686 -0.268 0.789269  V94 -7330.650 10959.287 -0.669 0.504913  V95 5551.521 9450.485 0.587 0.558075  V96 -3320.415 8349.562 -0.398 0.691613  V97 -2512.787 7974.922 -0.315 0.753272  V98 -5979.563 7355.289 -0.813 0.417935  V99 8283.253 7911.765 1.047 0.297336  V100 -101.926 3591.166 -0.028 0.977407  ---  Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1  Residual standard error: 1.22 on 114 degrees of freedom  Multiple R-squared: 0.9951, Adjusted R-squared: 0.9908  F-statistic: 232 on 100 and 114 DF, p-value: < 2.2e-16  >  > rgmod <- lm.ridge(fat ~ .,data=hw13, lambda = seq(0, 6e-08, len=21))  > matplot(rgmod$lambda, coef(rgmod), type="l", xlab=expression(lambda),ylab=expression(hat(beta)),col=1)  > which.min(rgmod$GCV) #use the generalized cross validation (GCV) estimate  3.0e-08  11  > abline(v=3.0e-08)  > rgmod$coef #prints out the coefficients  0.0e+00 3.0e-09 6.0e-09 9.0e-09 1.2e-08 1.5e-08 1.8e-08  V1 4466.42092 4338.1452 4252.799851 4192.0979 4145.9725 4109.055892 4078.28088  V2 -5020.78889 -5278.2512 -5354.793659 -5376.7388 -5374.9619 -5360.712896 -5339.12769  V3 -2470.23970 -960.6362 -247.318978 182.0426 471.2615 678.581068 832.91865  V4 9698.25870 6924.4942 5594.097025 4759.1875 4163.9740 3708.287058 3343.50888  V5 -11923.91822 -8703.5132 -7227.365474 -6332.9361 -5711.4218 -5244.678053 -4876.69409  V6 5388.04460 3120.3231 2150.893047 1592.5993 1217.5174 941.937037 727.77287  V7 -4857.38133 -3784.0483 -3377.939157 -3161.6546 -3020.4777 -2915.639592 -2831.07533  V8 3038.85747 2739.5423 2655.772293 2629.6927 2622.9006 2622.840563 2624.72363  V9 337.36741 317.7620 281.224943 240.5006 201.2338 165.309359 133.15875  V10 1521.44451 952.7991 662.427819 496.7290 396.7537 335.150126 297.51408  V11 -4597.57407 -2641.3084 -1580.985427 -901.9813 -426.9490 -75.834833 193.67477  V12 15193.37472 11029.8718 8863.719630 7498.9925 6547.2025 5840.172164 5291.80030  V13 -17085.21001 -11635.0578 -8891.332088 -7213.2929 -6071.3559 -5239.700236 -4604.84590  V14 12837.50553 8375.7339 6202.199716 4914.5348 4062.1663 3455.447904 3000.71870  V15 -6138.35802 -4458.3320 -3725.832560 -3343.3458 -3121.4596 -2983.183496 -2892.21890  V16 -3179.70560 -3105.9702 -2960.581726 -2820.8276 -2698.0570 -2592.094314 -2500.57346  V17 1165.70069 1655.0846 1813.834336 1886.6152 1927.1649 1952.687937 1970.01336  V18 2402.65404 1991.5200 1837.117775 1766.4375 1732.1290 1715.974307 1709.55119  V19 4073.94421 3546.2170 3248.097270 3012.1810 2805.7031 2618.687189 2446.92377  V20 -5627.74626 -5127.3806 -5020.025383 -4974.4206 -4936.5715 -4895.989206 -4851.38622  V21 -9000.39993 -8174.8433 -7317.782194 -6605.9045 -6019.8299 -5530.226612 -5114.33919  V22 17224.10849 14896.9884 13337.882854 12203.9360 11329.5477 10627.188367 10045.95790  V23 -5289.70137 -3196.0482 -2144.142947 -1514.1327 -1099.0105 -808.226111 -595.59202  V24 -7161.46399 -7470.4904 -7357.675681 -7133.5560 -6882.1892 -6631.945328 -6393.05249  V25 8022.52770 7250.9596 6599.287356 6049.2316 5581.5122 5179.764821 4831.15985  V26 -2365.92204 -2115.6869 -1898.968056 -1721.9919 -1578.4788 -1461.614070 -1365.79099  V27 -3084.62444 -2366.2568 -1890.734816 -1520.9848 -1216.2728 -957.557287 -733.73043  V28 11793.09506 10390.7206 9416.464977 8655.6991 8032.8073 7508.637110 7059.14480  V29 -19747.18172 -16967.8218 -15332.321708 -14171.4771 -13275.0804 -12548.879678 -11941.85735  V30 16613.93586 11887.4308 9536.406305 8053.0806 7003.6437 6209.594923 5581.67214  V31 -11668.80931 -6585.0917 -4299.638531 -2976.9278 -2108.6522 -1493.560302 -1034.87754  V32 9540.68730 5944.4605 4455.589606 3666.4497 3192.1781 2884.117335 2673.04981  V33 -1923.98768 171.6217 909.288048 1220.1170 1354.7837 1406.239963 1415.35002  V34 -3456.42140 -4784.9135 -5114.467328 -5157.0773 -5096.7807 -4997.953190 -4886.73081  V35 -2779.49818 -1922.6423 -1697.089571 -1657.4869 -1688.0737 -1747.181459 -1817.13786  V36 5528.68697 4987.1614 4667.998211 4444.1909 4274.3116 4138.823238 4026.84984  V37 -4471.33183 -4254.9541 -3957.933941 -3672.0661 -3411.9644 -3177.961240 -2967.33518  V38 -218.86450 844.1970 1256.478930 1448.3751 1541.8164 1585.126524 1601.01904  V39 10706.41891 7271.3748 5549.796282 4492.1969 3774.1894 3255.622540 2864.64663  V40 -12879.96800 -7389.4894 -4744.634119 -3165.6171 -2119.8014 -1382.144485 -839.18085  V41 16045.70444 9927.3992 7245.693065 5722.3627 4738.3414 4050.027641 3541.20088  V42 -17508.99262 -12326.6487 -10267.267668 -9153.6671 -8448.1519 -7954.398424 -7584.15925  V43 6442.75580 2830.7325 1403.434409 625.2645 129.7851 -215.147448 -469.24499  V44 -5414.75552 -2969.9661 -1761.004885 -979.9121 -416.0065 15.545022 357.79373  V45 12377.92416 10997.7312 10138.421561 9505.7044 9006.4684 8596.942046 8252.17951  V46 -4823.22614 -4458.7697 -4218.818317 -4035.0299 -3884.7520 -3757.405032 -3647.00092  V47 -2566.76354 -2469.8745 -2364.260860 -2267.6117 -2181.4202 -2104.501243 -2035.38002  2.1e-08 2.4e-08 2.7e-08 3.0e-08 3.3e-08 3.6e-08 3.9e-08  V1 4051.78177 4028.36489 4007.234782 3987.84328 3969.80200 3952.829189 3936.716254  V2 -5312.92109 -5283.68174 -5252.409831 -5219.77009 -5186.22258 -5152.095795 -5117.629873  V3 950.61844 1041.77534 1113.035749 1168.99011 1212.92843 1247.279076 1273.877756  V4 3042.50215 2788.58143 2570.747307 2381.36233 2214.90783 2067.268949 1935.298830  V5 -4576.85411 -4326.66285 -4114.102833 -3930.92762 -3771.23624 -3630.664667 -3505.898943  V6 554.97105 411.79465 290.810231 187.01807 96.89479 17.864484 -52.012369  V7 -2759.11276 -2695.67223 -2638.391064 -2585.80188 -2536.93877 -2491.134071 -2447.906800  V8 2626.57921 2627.58894 2627.442721 2626.06432 2623.48614 2619.789152 2615.073289  V9 104.66330 79.51075 57.339866 37.79851 20.56538 5.355981 -8.077974  V10 275.56889 264.24756 260.295581 261.54283 266.49846 274.113194 283.633876  V11 406.36661 577.84650 718.478933 835.43692 933.85012 1017.486476 1089.176122  V12 4852.87152 4492.97266 4192.184383 3936.85916 3717.30417 3526.429973 3358.922669  V13 -4103.17522 -3696.10762 -3358.813499 -3074.55034 -2831.59611 -2621.485418 -2437.943672  V14 2646.47939 2362.11773 2128.319444 1932.30825 1765.30028 1621.059337 1495.035783  V15 -2829.66015 -2784.92545 -2751.759266 -2726.30157 -2706.08710 -2689.496567 -2675.441541  V16 -2421.01807 -2351.30163 -2289.696612 -2234.82234 -2185.57733 -2141.079184 -2100.616154  V17 1982.28716 1991.13582 1997.484248 2001.90307 2004.76992 2006.350188 2006.840021  V18 1708.50261 1710.40418 1713.840689 1717.96071 1722.24374 1726.370857 1730.149312  V19 2288.07996 2140.57486 2003.194594 1874.94049 1754.96014 1642.511340 1536.940342  V20 -4803.51748 -4753.43616 -4702.067238 -4650.13303 -4598.17157 -4546.573655 -4495.617919  V21 -4755.73225 -4442.52312 -4165.971797 -3919.51742 -3698.13621 -3497.910614 -3315.735198  V22 9553.98007 9130.11825 8759.712029 8432.21792 8139.82444 7876.598773 7637.939186  V23 -435.03800 -310.74344 -212.568313 -133.72914 -69.52857 -16.619968 27.438535  V24 -6168.89089 -5960.05433 -5765.983153 -5585.66835 -5417.96689 -5261.743707 -5115.932934  V25 4525.80166 4256.03392 4015.876570 3800.60582 3606.44731 3430.352102 3269.831905  V26 -1286.64557 -1220.81568 -1165.702847 -1119.28349 -1079.96772 -1046.495185 -1017.858199  V27 -537.48667 -363.66530 -208.446049 -68.90535 57.25094 171.859207 276.413522  V28 6668.15635 6324.16256 6018.651057 5745.14278 5498.59406 5275.005993 5071.158834  V29 -11423.01729 -10972.01189 -10574.725063 -10220.95023 -9903.06644 -9615.234804 -9352.886190  V30 5069.34956 4641.46538 4277.553454 3963.51137 3689.24722 3447.314919 3232.080302  V31 -679.91865 -397.40355 -167.529876 22.87499 182.92585 319.135742 436.284822  V32 2522.66013 2412.23137 2329.184221 2265.50085 2215.86795 2176.649976 2145.291780  V33 1402.07758 1376.88577 1345.528088 1311.27091 1276.00336 1240.823953 1206.364969  V34 -4774.53371 -4666.43814 -4564.583611 -4469.69315 -4381.79726 -4300.594387 -4225.635784  V35 -1889.75088 -1961.06587 -2029.181814 -2093.24685 -2152.96197 -2208.322627 -2259.479008  V36 3931.73736 3849.15342 3776.147375 3710.63868 3651.11878 3596.468148 3545.839342  V37 -2776.97212 -2604.03829 -2446.113777 -2301.17360 -2167.53105 -2043.778564 -1928.736082  V38 1601.33631 1592.69126 1578.954991 1562.46818 1544.67607 1526.480852 1508.446040  V39 2560.27356 2317.31819 2119.428166 1955.52149 1817.82509 1700.730356 1600.093062  V40 -427.01622 -106.79644 146.493463 349.68839 514.52793 649.441085 760.629569  V41 3149.28007 2837.60401 2583.305869 2371.40884 2191.71012 2037.029508 1902.173636  V42 -7292.14603 -7052.84564 -6850.843755 -6676.30159 -6522.65274 -6385.348887 -6261.138537  V43 -663.71867 -816.63579 -939.272550 -1039.08287 -1121.22092 -1189.381522 -1246.292300  V44 635.86727 865.82485 1058.589476 1221.93192 1361.57055 1481.826035 1586.033172  V45 7956.33557 7698.63577 7471.402339 7268.97207 7087.05432 6922.327292 6772.172615  V46 -3549.72913 -3462.97276 -3384.837423 -3313.89830 -3249.05230 -3189.425885 -3134.314552  V47 -1972.76352 -1915.60134 -1863.056016 -1814.45994 -1769.27720 -1727.073395 -1687.492743  4.2e-08 4.5e-08 4.8e-08 5.1e-08 5.4e-08 5.7e-08 6.0e-08  V1 3921.30604 3906.47830 3892.13972 3878.21702 3864.65199 3851.39791 3838.41694  V2 -5083.00362 -5048.35201 -5013.77799 -4979.36057 -4945.16069 -4911.22536 -4877.59080  V3 1294.13991 1309.17522 1319.86610 1326.92285 1330.92337 1332.34223 1331.57236  V4 1816.54015 1709.04018 1611.22385 1521.80428 1439.71816 1364.07816 1294.13722  V5 -3394.36740 -3294.03801 -3203.28040 -3120.76919 -3045.41453 -2976.31125 -2912.70083  V6 -114.23156 -169.96976 -220.16815 -265.59028 -306.86319 -344.50734 -378.95879  V7 -2406.89807 -2367.83195 -2330.49083 -2294.69921 -2260.31288 -2227.21137 -2195.29256  V8 2609.44261 2602.99805 2595.83396 2588.03685 2579.68501 2570.84884 2561.59135  V9 -19.95171 -30.45136 -39.73786 -47.95054 -55.21033 -61.62238 -67.27844  V10 294.51104 306.33849 318.81269 331.70487 344.84149 358.09028 371.35019  V11 1151.08538 1204.89966 1251.94895 1293.29588 1329.79898 1362.15872 1390.95178  V12 3210.71568 3078.64103 2960.19226 2853.35919 2756.51014 2668.30638 2587.63893  V13 -2276.21605 -2132.63004 -2004.30163 -1888.93276 -1784.66853 -1689.99438 -1603.66091  V14 1383.83194 1284.85843 1196.10644 1115.99292 1043.25273 976.86213 915.98327  V15 -2663.17631 -2652.18188 -2642.09239 -2632.64725 -2623.65940 -2614.99381 -2606.55269  V16 -2063.60967 -2029.58559 -1998.15228 -1968.98372 -1941.80658 -1916.39008 -1892.53813  V17 2006.39055 2005.12222 2003.13361 2000.50720 1997.31315 1993.61193 1989.45630  V18 1733.46688 1736.26339 1738.51251 1740.20990 1741.36540 1741.99774 1742.13104  V19 1437.66717 1344.17467 1255.99996 1172.72740 1093.98271 1019.42799 948.75750  V20 -4445.49918 -4396.35019 -4348.25782 -4301.27519 -4255.43051 -4210.73378 -4167.18166  V21 -3149.11197 -2996.00511 -2854.73601 -2723.90595 -2602.33845 -2489.03549 -2383.14385  V22 7420.21144 7220.50014 7036.43433 6866.06241 6707.76063 6560.16495 6422.11964  V23 64.46519 95.83778 122.61639 145.62759 165.52364 182.82464 197.94931  V24 -4979.56087 -4851.75056 -4731.71792 -4618.76430 -4512.26779 -4411.67464 -4316.49117  V25 3122.83665 2987.66250 2862.88192 2747.29000 2639.86271 2539.72420 2446.12096  V26 -993.24467 -971.99531 -953.57127 -937.52939 -923.50320 -911.18800 -900.32933  V27 372.14623 460.08578 541.09927 615.92435 685.19360 749.45333 809.17844  V28 4884.42585 4712.63940 4553.99257 4406.96554 4270.26961 4142.80413 4023.62274  V29 -9112.38112 -8890.77653 -8685.66122 -8495.03711 -8317.23167 -8150.83225 -7994.63604  V30 3039.18899 2865.21447 2707.41808 2563.58107 2431.88426 2310.82020 2199.12784  V31 537.96162 626.91286 705.27653 774.74151 836.65936 892.12427 942.03136  V32 2119.95616 2099.29596 2082.30634 2068.22653 2056.47284 2046.59222 2038.22927  V33 1172.97835 1140.84536 1110.04286 1080.58400 1052.44368 1025.57450 999.91693  V34 -4156.42144 -4092.44963 -4033.24167 -3978.35323 -3927.37840 -3879.94987 -3835.73715  V35 -2306.65847 -2350.12190 -2390.13903 -2426.97472 -2460.88159 -2492.09635 -2520.83836  V36 3498.57978 3454.17926 3412.23342 3372.41784 3334.46932 3298.17210 3263.34758  V37 -1821.40847 -1720.95134 -1626.64373 -1537.86635 -1454.08419 -1374.83246 -1299.70537  V38 1490.91952 1474.10969 1458.13387 1443.04951 1428.87482 1415.60243 1403.20861  V39 1512.78833 1436.41822 1369.11419 1309.40037 1256.09690 1208.25031 1165.08251  V40 852.75218 929.37184 993.25611 1046.58434 1091.09358 1128.18333 1158.99208  V41 1783.29701 1677.49362 1582.52791 1496.65262 1418.48281 1346.90668 1281.02145  V42 -6147.63307 -6043.03553 -5945.96537 -5855.34206 -5770.30564 -5690.16139 -5614.34050  V43 -1294.01650 -1334.14701 -1367.93514 -1396.37864 -1420.28341 -1440.30785 -1456.99519  V44 1676.81148 1756.24937 1826.03317 1887.53968 1941.90408 1990.07048 2032.83021  V45 6634.49461 6507.59363 6390.07515 6280.78313 6178.75040 6083.16107 5993.32159  V46 -3083.14155 -3035.42874 -2990.77543 -2948.84272 -2909.34163 -2872.02395 -2836.67512  V47 -1650.24074 -1615.07113 -1581.77600 -1550.17826 -1520.12576 -1491.48679 -1464.14648  [ reached getOption("max.print") -- omitted 53 rows ]  >  >  > hw13\_2 <- meatspec[,-(1:70)]  > hw13\_2 <- data.frame(hw13\_2)  > describe(hw13\_2)  vars n mean sd median trimmed mad min max range skew kurtosis se  V71 1 215 3.57 0.55 3.50 3.52 0.48 2.70 5.43 2.73 0.99 0.92 0.04  V72 2 215 3.56 0.55 3.49 3.51 0.48 2.69 5.42 2.73 0.99 0.91 0.04  V73 3 215 3.55 0.55 3.48 3.49 0.48 2.68 5.41 2.73 0.99 0.90 0.04  V74 4 215 3.53 0.55 3.46 3.48 0.49 2.66 5.40 2.73 0.99 0.90 0.04  V75 5 215 3.51 0.54 3.45 3.46 0.49 2.65 5.38 2.74 0.98 0.89 0.04  V76 6 215 3.50 0.54 3.43 3.44 0.50 2.63 5.37 2.74 0.98 0.88 0.04  V77 7 215 3.48 0.54 3.40 3.43 0.50 2.62 5.36 2.74 0.98 0.87 0.04  V78 8 215 3.46 0.54 3.38 3.41 0.51 2.60 5.34 2.74 0.97 0.85 0.04  V79 9 215 3.44 0.54 3.37 3.39 0.51 2.59 5.33 2.74 0.97 0.84 0.04  V80 10 215 3.42 0.54 3.35 3.37 0.51 2.57 5.32 2.75 0.97 0.83 0.04  V81 11 215 3.41 0.54 3.33 3.35 0.52 2.55 5.31 2.76 0.96 0.82 0.04  V82 12 215 3.39 0.54 3.30 3.34 0.52 2.53 5.30 2.76 0.96 0.80 0.04  V83 13 215 3.37 0.54 3.28 3.32 0.52 2.51 5.28 2.77 0.95 0.79 0.04  V84 14 215 3.35 0.54 3.26 3.30 0.52 2.50 5.27 2.78 0.95 0.78 0.04  V85 15 215 3.33 0.54 3.23 3.28 0.52 2.48 5.26 2.78 0.94 0.77 0.04  V86 16 215 3.31 0.54 3.21 3.26 0.52 2.46 5.24 2.78 0.94 0.75 0.04  V87 17 215 3.28 0.54 3.18 3.23 0.52 2.44 5.22 2.78 0.93 0.74 0.04  V88 18 215 3.26 0.54 3.16 3.21 0.52 2.42 5.20 2.78 0.93 0.72 0.04  V89 19 215 3.24 0.54 3.13 3.19 0.52 2.40 5.18 2.78 0.93 0.71 0.04  V90 20 215 3.22 0.54 3.11 3.17 0.52 2.38 5.16 2.78 0.92 0.70 0.04  V91 21 215 3.20 0.54 3.09 3.15 0.52 2.36 5.14 2.79 0.92 0.69 0.04  V92 22 215 3.18 0.54 3.08 3.13 0.52 2.34 5.13 2.79 0.91 0.68 0.04  V93 23 215 3.16 0.54 3.06 3.11 0.52 2.32 5.11 2.79 0.91 0.66 0.04  V94 24 215 3.14 0.54 3.04 3.09 0.52 2.30 5.10 2.79 0.91 0.65 0.04  V95 25 215 3.12 0.54 3.01 3.07 0.51 2.28 5.08 2.80 0.90 0.64 0.04  V96 26 215 3.10 0.54 2.99 3.05 0.51 2.26 5.06 2.80 0.90 0.63 0.04  V97 27 215 3.08 0.54 2.97 3.03 0.51 2.24 5.04 2.80 0.90 0.62 0.04  V98 28 215 3.06 0.54 2.95 3.01 0.51 2.22 5.02 2.79 0.90 0.61 0.04  V99 29 215 3.04 0.54 2.94 2.99 0.51 2.21 4.99 2.79 0.89 0.60 0.04  V100 30 215 3.02 0.54 2.92 2.98 0.51 2.19 4.97 2.78 0.89 0.59 0.04  fat 31 215 18.14 12.74 14.00 16.70 11.27 0.90 49.10 48.20 0.80 -0.45 0.87  >  > rgmod\_2 <- lm.ridge(fat ~ .,data=hw13\_2, lambda = seq(0, 6e-08, len=21))  > matplot(rgmod\_2$lambda, coef(rgmod), type="l", xlab=expression(lambda),ylab=expression(hat(beta)),col=1)  > which.min(rgmod\_2$GCV) #use the generalized cross validation (GCV) estimate  6.0e-08  21  > abline(v=3.0e-08)  > rgmod\_2$coef #prints out the coefficients  0.0e+00 3.0e-09 6.0e-09 9.0e-09 1.2e-08 1.5e-08 1.8e-08  V71 -2133.89336 -2170.56248 -2196.8374 -2216.0335 -2230.20976 -2240.71230 -2248.4569  V72 397.84564 574.50906 705.8683 806.4117 885.16430 948.03096 999.0262  V73 6278.75314 5997.02142 5788.7440 5630.3015 5506.93036 5408.95458 5329.7926  V74 -97.46188 46.42326 140.1374 200.6325 238.42426 260.34318 270.9870  V75 -4730.40730 -4637.39430 -4547.3922 -4461.5892 -4380.37539 -4303.76974 -4231.6183  V76 -3494.13637 -3506.93376 -3516.9227 -3524.1055 -3528.76105 -3531.22871 -3531.8330  V77 7148.41079 6894.50333 6667.1424 6461.0727 6272.63468 6099.13146 5938.4913  V78 -4459.78645 -4303.98576 -4143.2397 -3983.7556 -3828.61213 -3679.29090 -3536.4238  V79 -3501.05311 -3332.33852 -3201.0490 -3095.2454 -3007.65929 -2933.60864 -2869.9353  V80 3680.05653 3374.36897 3098.9469 2848.9393 2620.67245 2411.26900 2218.4128  V81 2429.45786 2410.80475 2408.7959 2417.6108 2433.54977 2454.15393 2477.7391  V82 -6423.71977 -5802.28597 -5260.3650 -4783.6457 -4361.10923 -3984.12195 -3645.8157  V83 14066.10804 13260.42154 12516.4107 11833.2719 11206.84841 10631.99909 10103.5574  V84 -14715.72394 -14372.61490 -13996.1982 -13614.4141 -13240.76668 -12881.64337 -12539.7803  V85 -3435.92974 -2742.61746 -2239.8237 -1859.6821 -1562.45126 -1323.54453 -1127.0566  V86 26718.97881 24642.66294 22991.7367 21637.5257 20499.78547 19525.66180 18678.7881  V87 -24428.70491 -21841.88382 -19797.5815 -18135.8637 -16755.17495 -15587.62157 -14585.9288  V88 -555.59951 -1868.15027 -2839.7590 -3575.4952 -4141.95660 -4583.42838 -4930.4847  V89 17532.74469 17146.95745 16742.5617 16335.6636 15935.01189 15545.35995 15169.1912  V90 -9973.09526 -9194.28536 -8513.9899 -7915.4466 -7385.05207 -6911.90267 -6487.2456  V91 665.70725 519.29310 367.3358 223.5951 92.90796 -23.67329 -126.6896  V92 -3658.67761 -3764.50282 -3814.0101 -3833.4828 -3836.38597 -3829.96347 -3818.2598  V93 6184.95662 5761.14019 5391.8325 5066.2701 4776.20573 4515.33185 4278.7856  V94 -14142.69738 -13176.76262 -12368.7276 -11676.3259 -11072.16332 -10537.51433 -10059.0301  V95 12942.10008 12047.14592 11309.1884 10685.5370 10148.63615 9679.68974 9265.3115  V96 3507.63424 3720.15353 3877.3220 3994.6347 4082.24282 4147.14795 4194.3717  V97 -11386.75699 -11007.59227 -10665.3213 -10351.4149 -10060.41631 -9788.59323 -9533.2517  V98 8605.76796 8368.79541 8131.8931 7899.8684 7675.07213 7458.58087 7250.7843  V99 -3229.31385 -3363.73075 -3441.3118 -3482.6778 -3500.14230 -3501.43496 -3491.6009  V100 214.55856 327.55979 410.7303 473.9580 523.26302 562.50919 594.2827  2.1e-08 2.4e-08 2.7e-08 3.0e-08 3.3e-08 3.6e-08 3.9e-08 4.2e-08  V71 -2254.0872 -2258.0675 -2260.7407 -2262.3647 -2263.1368 -2263.2103 -2262.7056 -2261.7187  V72 1040.9655 1075.8747 1105.2436 1130.1878 1151.5568 1170.0062 1186.0488 1200.0898  V73 5264.8324 5210.7617 5165.1525 5126.1935 5092.5133 5063.0595 5037.0158 5013.7421  V74 273.5382 270.2496 262.7454 252.2133 239.5327 225.3605 210.1912 194.3988  V75 -4163.6901 -4099.7250 -4039.4586 -3982.6342 -3929.0089 -3878.3557 -3830.4647 -3785.1421  V76 -3530.8595 -3528.5517 -3525.1135 -3520.7155 -3515.4997 -3509.5851 -3503.0714 -3496.0429  V77 5789.0728 5649.5444 5518.8056 5395.9331 5280.1428 5170.7621 5067.2086 4968.9746  V78 -3400.1801 -3270.4762 -3147.0921 -3029.7385 -2918.0956 -2811.8352 -2710.6344 -2614.1822  V79 -2814.4258 -2765.4779 -2721.8992 -2682.7813 -2647.4181 -2615.2504 -2585.8289 -2558.7875  V80 2040.1994 1875.0353 1721.5697 1578.6445 1445.2576 1320.5352 1203.7108 1094.1078  V81 2503.1275 2529.4836 2556.2100 2582.8776 2609.1789 2634.8947 2659.8710 2684.0020  V82 -3340.6535 -3064.1177 -2812.4836 -2582.6501 -2372.0134 -2178.3697 -1999.8406 -1834.8147  V83 9616.7059 9167.1000 8750.8826 8364.6544 8005.4280 7670.5783 7357.7963 7065.0467  V84 -12215.9995 -11910.1167 -11621.4324 -11349.0004 -11091.7789 -10848.7124 -10618.7776 -10401.0060  V85 -962.3082 -821.8984 -700.5562 -594.4366 -500.6748 -417.0953 -342.0179 -274.1249  V86 17933.2328 17269.9476 16674.5843 16136.1002 15645.8373 15196.8960 14783.6993 14401.6818  V87 -13716.0751 -12952.8987 -12277.3581 -11674.7572 -11133.5598 -10644.5748 -10200.3834 -9794.9273  V88 -5204.8813 -5422.4892 -5595.1302 -5731.7677 -5839.3027 -5923.1193 -5987.4679 -6035.7383  V89 14807.6607 14461.1332 14129.5015 13812.3798 13509.2232 13219.4030 12942.2533 12677.1013  V90 -6104.0081 -5756.4264 -5439.7616 -5150.0838 -4884.1061 -4639.0591 -4412.5918 -4202.6952  V91 -217.3006 -296.8432 -366.6350 -427.8918 -481.6994 -529.0110 -570.6556 -607.3505  V92 -3803.5970 -3787.3359 -3770.2840 -3752.9236 -3735.5420 -3718.3077 -3701.3166 -3684.6194  V93 4062.7733 3864.2973 3680.9578 3510.8095 3352.2571 3203.9773 3064.8619 2933.9732  V94 -9626.8660 -9233.5555 -8873.3015 -8541.5124 -8234.4889 -7949.2058 -7683.1574 -7434.2438  V95 8895.6338 8563.1765 8262.1364 7987.9231 7736.8453 7505.8924 7292.5790 7094.8303  V96 4227.6259 4249.7209 4262.8252 4268.6384 4268.5101 4263.5234 4254.5552 4242.3215  V97 -9292.3593 -9064.3257 -8847.8689 -8641.9294 -8445.6135 -8258.1551 -8078.8876 -7907.2252  V98 7051.6942 6861.1141 6678.7356 6504.1945 6337.1030 6177.0698 6023.7113 5876.6579  V99 -3474.0369 -3451.0879 -3424.4056 -3395.1725 -3364.2465 -3332.2561 -3299.6654 -3266.8186  V100 620.3748 642.0625 660.2780 675.7161 688.9043 700.2490 710.0680 718.6128  4.5e-08 4.8e-08 5.1e-08 5.4e-08 5.7e-08 6.0e-08  V71 -2260.3267 -2258.5924 -2256.5672 -2254.29336 -2251.80634 -2249.13572  V72 1212.4532 1223.3999 1233.1422 1241.85402 1249.67889 1256.73608  V73 4992.7323 4973.5828 4955.9695 4939.63069 4924.35337 4909.96367  V74 178.2672 162.0123 145.7976 129.74721 113.95410 98.48747  V75 -3742.2100 -3701.5048 -3662.8762 -3626.18639 -3591.30849 -3558.12587  V76 -3488.5708 -3480.7159 -3472.5300 -3464.05787 -3455.33809 -3446.40416  V77 4875.6143 4786.7342 4701.9850 4621.05528 4543.66618 4469.56700  V78 -2522.1836 -2434.3615 -2350.4567 -2270.22803 -2193.45159 -2119.91957  V79 -2533.8242 -2510.6875 -2489.1655 -2469.07874 -2450.27350 -2432.61757  V80 991.1259 894.2306 802.9435 716.83542 635.51958 558.64666  V81 2707.2181 2729.4766 2750.7550 2771.04584 2790.35312 2808.68908  V82 -1681.9011 -1539.8930 -1407.7376 -1284.51245 -1169.40568 -1061.69985  V83 6790.5307 6532.6548 6290.0027 6061.31253 5845.45630 5641.42320  V84 -10194.4942 -9998.4077 -9811.9792 -9634.50623 -9465.34640 -9303.91292  V85 -212.3679 -155.9023 -104.0396 -56.21227 -11.94818 29.14934  V86 14047.0639 13716.6849 13407.8775 13118.37231 12846.22386 12589.75314  V87 -9423.2077 -9081.0611 -8764.9905 -8472.03611 -8199.67481 -7945.74216  V88 -6070.6594 -6094.4462 -6108.9099 -6115.54145 -6115.57581 -6110.04145  V89 12423.2852 12180.1657 11947.1320 11723.60557 11509.04107 11302.92653  V90 -4007.6424 -3825.9397 -3656.2888 -3497.55554 -3348.74443 -3208.97808  V91 -639.7156 -668.2857 -693.5233 -715.82819 -735.54708 -752.98097  V92 -3668.2398 -3652.1841 -3636.4489 -3621.02477 -3605.89922 -3591.05830  V93 2810.5114 2693.7885 2583.2084 2478.25104 2378.45990 2283.43182  V94 -7200.6880 -6980.9721 -6773.7892 -6578.00585 -6392.63242 -6216.79974  V95 6910.8985 6739.2983 6578.7582 6428.18178 6286.61813 6153.23761  V96 4227.4104 4210.3079 4191.4175 4171.07576 4149.56430 4127.11953  V97 -7742.6474 -7584.6887 -7432.9294 -7286.98962 -7146.52316 -7011.21366  V98 5735.5576 5600.0776 5469.9050 5344.74595 5224.32568 5108.38719  V99 -3233.9717 -3201.3151 -3168.9895 -3137.09862 -3105.71737 -3074.89905  V100 726.0845 732.6456 738.4288 743.54308 748.07864 752.11085 |
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**QUESTION:** Are the ridge regression estimates for V71-V100 at the GCV chosen lambda  
similar to the ridge regression estimates for V71-V100 at the GCV chosen  
lambda for the ridge regression performed on all 100 variables?

**ANSWER**: NO