load regyx.txt; y = regyx(:,1); x = regyx(:,2);

n=100;

X = [ones(n,1) x]; p = 2;

% prior hyperparameters;

a = 3;b = 2.5;

mu\_beta = zeros(p,1); V\_beta = 4\*eye(p);

invV\_beta = inv(V\_beta);

% Marg Lkd Calculation

D = (det(V\_beta))\*det( (invV\_beta + X'\*X));

E = eye(n) - X\*(inv(invV\_beta + X'\*X))\*X';

C = ( (2\*pi)^(-n/2))\*(D^(-1/2))\*gamma( (n/2)+a)\*(b^(-a))\*inv(gamma(a));

ML = C\*(inv(b) + .5\*y'\*E\*y)^(-( (n/2) + a));

disp('Log Marginal Likelihood'); log(ML)

load regyx1x2.txt; y=regyx1x2(:,1); x1=regyx1x2(:,2); x2=regyx1x2(:,3)

X = [ones(n,1) x1 x2]; p = 3;

% prior hyperparameters;

a = 3;b = 2.5;

mu\_beta = zeros(p,1); V\_beta = 4\*eye(p);

invV\_beta = inv(V\_beta);

% Marg Lkd Calculation

D = (det(V\_beta))\*det( (invV\_beta + X'\*X));

E = eye(n) - X\*(inv(invV\_beta + X'\*X))\*X';

C = ( (2\*pi)^(-n/2))\*(D^(-1/2))\*gamma( (n/2)+a)\*(b^(-a))\*inv(gamma(a));

ML = C\*(inv(b) + .5\*y'\*E\*y)^(-( (n/2) + a));

disp('Log Marginal Likelihood');

log(ML)

regyx.txt

|  |  |
| --- | --- |
| 1.2108 | 0.7585 |
| 0.1177 | -0.5828 |
| 1.1535 | 1.0152 |
| 0.915 | 0.5901 |
| 0.027 | -1.0505 |
| 0.4271 | 0.4049 |
| 1.0988 | 0.2517 |
| 0.5882 | -1.0807 |
| 1.9217 | 1.5056 |
| 0.9978 | -0.2413 |
| 0.6199 | -0.3928 |
| 0.6129 | -1.063 |
| 2.4115 | 2.2558 |
| 0.2412 | -0.6865 |
| 1.6169 | -0.0477 |
| 1.4145 | 0.432 |
| 1.2407 | 0.9019 |
| 1.9648 | 1.7652 |
| 1.5365 | 0.6853 |
| 0.401 | -1.359 |
| 0.7121 | -0.044 |
| 1.8066 | 0.7119 |
| 1.7107 | -0.7505 |
| 0.7253 | -0.9564 |
| 1.8188 | 0.712 |
| 0.2709 | -0.1319 |
| 0.8082 | -0.4771 |
| 0.4301 | -0.3665 |
| 0.1006 | -1.4195 |
| 0.7731 | 0.4263 |
| 1.1659 | -0.4715 |
| 1.5375 | 0.7685 |
| 0.4274 | -1.0629 |
| 0.105 | -1.1285 |
| 0.9883 | 0.5863 |
| 0.0364 | -1.0338 |
| 0.8108 | 0.0388 |
| 0.9915 | 0.6447 |
| 1.2833 | 0.8648 |
| 1.1813 | 0.5745 |
| 1.3932 | -0.8642 |
| 0.8303 | -0.3327 |
| 0.7761 | 0.6435 |
| 2.0685 | 0.8406 |
| 0.0997 | -1.5199 |
| 0.1878 | -0.4111 |
| 0.4939 | 0.0622 |
| 1.1258 | -0.7248 |
| 0.8546 | 0.059 |
| 0.9935 | 0.3001 |
| 1.6498 | 0.0094 |
| 0.8084 | -0.7474 |
| 0.3503 | -0.1902 |
| 0.7232 | 1.2947 |
| 1.1362 | -1.3611 |
| 1.9467 | 2.0202 |
| 0.1035 | -0.3586 |
| 1.9413 | 1.0024 |
| 1.5589 | 0.8945 |
| 0.6548 | -0.5333 |
| 0.3761 | -1.662 |
| 1.0626 | 1.064 |
| -0.4948 | -2.6544 |
| 1.0439 | 1.0029 |
| 1.488 | 0.8643 |
| 1.28 | 0.3779 |
| 0.7964 | 0.4174 |
| 1.4519 | 0.1693 |
| 1.1452 | 0.5318 |
| 1.1983 | 1.4415 |
| 1.9706 | 2.0724 |
| 0.3892 | -2.2255 |
| 0.0072 | -0.6247 |
| -0.2631 | -2.5956 |
| 0.4548 | -0.9411 |
| 0.6188 | -1.1151 |
| 0.8806 | -0.2189 |
| 0.3701 | -0.206 |
| 1.0779 | -0.9007 |
| 1.2783 | 1.0668 |
| 1.271 | 0.9279 |
| 1.2836 | 0.3517 |
| 1.1761 | 0.74 |
| 0.7419 | -0.0011 |
| 1.2744 | 0.6748 |
| 2.3708 | 1.8014 |
| 1.0241 | 0.0736 |
| -0.033 | -1.1349 |
| 0.8908 | -0.822 |
| 0.2162 | -1.2196 |
| 0.7884 | -0.3623 |
| 0.476 | -0.4616 |
| 1.5179 | 0.2356 |
| 1.0944 | -1.1467 |
| 0.6745 | -0.8324 |
| -0.3179 | -1.9909 |
| 0.7908 | -1.3221 |
| 1.1819 | -0.5055 |
| 0.1375 | 0.1266 |
| 0.6351 | -0.7581 |

regyx1x2.txt

|  |  |  |
| --- | --- | --- |
| 1.2108 | 0.7585 | -0.4326 |
| 0.1177 | -0.5828 | -1.6656 |
| 1.1535 | 1.0152 | 0.1253 |
| 0.915 | 0.5901 | 0.2877 |
| 0.027 | -1.0505 | -1.1465 |
| 0.4271 | 0.4049 | 1.1909 |
| 1.0988 | 0.2517 | 1.1892 |
| 0.5882 | -1.0807 | -0.0376 |
| 1.9217 | 1.5056 | 0.3273 |
| 0.9978 | -0.2413 | 0.1746 |
| 0.6199 | -0.3928 | -0.1867 |
| 0.6129 | -1.063 | 0.7258 |
| 2.4115 | 2.2558 | -0.5883 |
| 0.2412 | -0.6865 | 2.1832 |
| 1.6169 | -0.0477 | -0.1364 |
| 1.4145 | 0.432 | 0.1139 |
| 1.2407 | 0.9019 | 1.0668 |
| 1.9648 | 1.7652 | 0.0593 |
| 1.5365 | 0.6853 | -0.0956 |
| 0.401 | -1.359 | -0.8323 |
| 0.7121 | -0.044 | 0.2944 |
| 1.8066 | 0.7119 | -1.3362 |
| 1.7107 | -0.7505 | 0.7143 |
| 0.7253 | -0.9564 | 1.6236 |
| 1.8188 | 0.712 | -0.6918 |
| 0.2709 | -0.1319 | 0.858 |
| 0.8082 | -0.4771 | 1.254 |
| 0.4301 | -0.3665 | -1.5937 |
| 0.1006 | -1.4195 | -1.441 |
| 0.7731 | 0.4263 | 0.5711 |
| 1.1659 | -0.4715 | -0.3999 |
| 1.5375 | 0.7685 | 0.69 |
| 0.4274 | -1.0629 | 0.8156 |
| 0.105 | -1.1285 | 0.7119 |
| 0.9883 | 0.5863 | 1.2902 |
| 0.0364 | -1.0338 | 0.6686 |
| 0.8108 | 0.0388 | 1.1908 |
| 0.9915 | 0.6447 | -1.2025 |
| 1.2833 | 0.8648 | -0.0198 |
| 1.1813 | 0.5745 | -0.1567 |
| 1.3932 | -0.8642 | -1.6041 |
| 0.8303 | -0.3327 | 0.2573 |
| 0.7761 | 0.6435 | -1.0565 |
| 2.0685 | 0.8406 | 1.4151 |
| 0.0997 | -1.5199 | -0.8051 |
| 0.1878 | -0.4111 | 0.5287 |
| 0.4939 | 0.0622 | 0.2193 |
| 1.1258 | -0.7248 | -0.9219 |
| 0.8546 | 0.059 | -2.1707 |
| 0.9935 | 0.3001 | -0.0592 |
| 1.6498 | 0.0094 | -1.0106 |
| 0.8084 | -0.7474 | 0.6145 |
| 0.3503 | -0.1902 | 0.5077 |
| 0.7232 | 1.2947 | 1.6924 |
| 1.1362 | -1.3611 | 0.5913 |
| 1.9467 | 2.0202 | -0.6436 |
| 0.1035 | -0.3586 | 0.3803 |
| 1.9413 | 1.0024 | -1.0091 |
| 1.5589 | 0.8945 | -0.0195 |
| 0.6548 | -0.5333 | -0.0482 |
| 0.3761 | -1.662 | 0 |
| 1.0626 | 1.064 | -0.3179 |
| -0.4948 | -2.6544 | 1.095 |
| 1.0439 | 1.0029 | -1.874 |
| 1.488 | 0.8643 | 0.4282 |
| 1.28 | 0.3779 | 0.8956 |
| 0.7964 | 0.4174 | 0.731 |
| 1.4519 | 0.1693 | 0.5779 |
| 1.1452 | 0.5318 | 0.0403 |
| 1.1983 | 1.4415 | 0.6771 |
| 1.9706 | 2.0724 | 0.5689 |
| 0.3892 | -2.2255 | -0.2556 |
| 0.0072 | -0.6247 | -0.3775 |
| -0.2631 | -2.5956 | -0.2959 |
| 0.4548 | -0.9411 | -1.4751 |
| 0.6188 | -1.1151 | -0.234 |
| 0.8806 | -0.2189 | 0.1184 |
| 0.3701 | -0.206 | 0.3148 |
| 1.0779 | -0.9007 | 1.4435 |
| 1.2783 | 1.0668 | -0.351 |
| 1.271 | 0.9279 | 0.6232 |
| 1.2836 | 0.3517 | 0.799 |
| 1.1761 | 0.74 | 0.9409 |
| 0.7419 | -0.0011 | -0.9921 |
| 1.2744 | 0.6748 | 0.212 |
| 2.3708 | 1.8014 | 0.2379 |
| 1.0241 | 0.0736 | -1.0078 |
| -0.033 | -1.1349 | -0.742 |
| 0.8908 | -0.822 | 1.0823 |
| 0.2162 | -1.2196 | -0.1315 |
| 0.7884 | -0.3623 | 0.3899 |
| 0.476 | -0.4616 | 0.088 |
| 1.5179 | 0.2356 | -0.6355 |
| 1.0944 | -1.1467 | -0.5596 |
| 0.6745 | -0.8324 | 0.4437 |
| -0.3179 | -1.9909 | -0.9499 |
| 0.7908 | -1.3221 | 0.7812 |
| 1.1819 | -0.5055 | 0.569 |
| 0.1375 | 0.1266 | -0.8217 |
| 0.6351 | -0.7581 | -0.2656 |