

The `lstbayes` package

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1 Introduction

This package provides language drivers for the `listings` package for the several Bayesian modeling languages: BUGS, JAGS, and Stan.

2 Usage

See the documentation of the `listings` package.

3 Implementation

```
1 \RequirePackage{listings}
```

3.1 BUGS

Language driver for BUGS, including WinBUGS and OpenBUGS. The driver is based on OpenBUGS v. 3.2.3.

```
2 \lstdefinlanguage{BUGS}{
3   morekeywords={1}{for,in,model,T,I,C},%
4   morecomment={1}{\#},%
5   sensitive=true,%
6   alsoletter={.},%
7   otherkeywords={<-,~},%
8   literate={<-}{\leftarrow}1 {~}{\sim}1%
9 }
10 \lstalias[] {OpenBUGS} [] {BUGS}
11 \lstalias[] {WinBUGS} [] {BUGS}
```

3.2 JAGS

Language driver for JAGS. The driver is based on JAGS version 3.4.0 (Sept 4, 2013).

```
12 \lstdefinlanguage[] {JAGS} [] {BUGS}{
```

```

13 morekeywords=[1]{data,var,const},%
14 morecomment=[n]{/*}{*/}%
15 }

```

3.3 Stan

Language driver for Stan. The driver is based on Stan modeling language version 2.8.0 (Sept 8, 2015).

```

16 \lstdefinlanguage{Stan}{
17   morekeywords=[1]{functions,data,parameters,transformed,model,generated,quantities,%
18     for,in,while,print,if,else,lp_,lower,upper,increment_log_prob,T,return,%
19     reject,integrate_ode},%
20   morekeywords=[2]{int,real,vector,%
21     ordered,positive_ordered,simplex,unit_vector,%
22     row_vector,matrix,%
23     cholesky_factor_corr,cholesky_factor_cov,%
24     cor_matrix,cov_matrix,%
25     void},%
26   morekeywords=[3]{%
27     Phi,Phi_approx,%
28     abs,acos,%
29     acosh,append_col,%
30     append_row,asin,%
31     asinh,atan,%
32     atan2,atanh,%
33     bernoulli_ccdf_log,bernoulli_cdf,%
34     bernoulli_cdf_log,bernoulli_log,%
35     bernoulli_logit_log,bernoulli_rng,%
36     bessel_first_kind,bessel_second_kind,%
37     beta_binomial_ccdf_log,beta_binomial_cdf,%
38     beta_binomial_cdf_log,beta_binomial_log,%
39     beta_binomial_rng,beta_ccdf_log,%
40     beta_cdf,beta_cdf_log,%
41     beta_log,beta_rng,%
42     binary_log_loss,binomial_ccdf_log,%
43     binomial_cdf,binomial_cdf_log,%
44     binomial_coefficient_log,binomial_log,%
45     binomial_logit_log,binomial_rng,%
46     block,categorical_log,%
47     categorical_logit_log,categorical_rng,%
48     cauchy_ccdf_log,cauchy_cdf,%
49     cauchy_cdf_log,cauchy_log,%
50     cauchy_rng,cbrr,%
51     ceil,chi_square_ccdf_log,%
52     chi_square_cdf,chi_square_cdf_log,%
53     chi_square_log,chi_square_rng,%
54     cholesky_decompose,col,%
55     cols,columns_dot_product,%
56     columns_dot_self,cos,%

```

```

57     cosh, crossprod, %
58     cumulative_sum, determinant, %
59     diag_matrix, diag_post_multiply, %
60     diag_pre_multiply, diagonal, %
61     digamma, dims, %
62     dirichlet_log, dirichlet_rng, %
63     distance, dot_product, %
64     dot_self, double_exponential_ccdf_log, %
65     double_exponential_cdf, double_exponential_cdf_log, %
66     double_exponential_log, double_exponential_rng, %
67     e, eigenvalues_sym, %
68     eigenvectors_sym, erf, %
69     erfc, exp, %
70     exp2, exp_mod_normal_ccdf_log, %
71     exp_mod_normal_cdf, exp_mod_normal_cdf_log, %
72     exp_mod_normal_log, exp_mod_normal_rng, %
73     expm1, exponential_ccdf_log, %
74     exponential_cdf, exponential_cdf_log, %
75     exponential_log, exponential_rng, %
76     fabs, falling_factorial, %
77     fdim, floor, %
78     fma, fmax, %
79     fmin, fmod, %
80     frechet_ccdf_log, frechet_cdf, %
81     frechet_cdf_log, frechet_log, %
82     frechet_rng, gamma_ccdf_log, %
83     gamma_cdf, gamma_cdf_log, %
84     gamma_log, gamma_p, %
85     gamma_q, gamma_rng, %
86     gaussian_dlm_obs_log, get_lp, %
87     gumbel_ccdf_log, gumbel_cdf, %
88     gumbel_cdf_log, gumbel_log, %
89     gumbel_rng, head, %
90     hypergeometric_log, hypergeometric_rng, %
91     hypot, if_else, %
92     int_step, inv, %
93     inv_chi_square_ccdf_log, inv_chi_square_cdf, %
94     inv_chi_square_cdf_log, inv_chi_square_log, %
95     inv_chi_square_rng, inv_cloglog, %
96     inv_gamma_ccdf_log, inv_gamma_cdf, %
97     inv_gamma_cdf_log, inv_gamma_log, %
98     inv_gamma_rng, inv_logit, %
99     inv_sqrt, inv_square, %
100    inv_wishart_log, inv_wishart_rng, %
101    inverse, inverse_spd, %
102    is_inf, is_nan, %
103    lbeta, lgamma, %
104    lkj_corr_cholesky_log, lkj_corr_cholesky_rng, %
105    lkj_corr_log, lkj_corr_rng, %
106    lmgamma, log, %

```

```

107     log10,log1m,%
108     log1m_exp,log1m_inv_logit,%
109     log1p,log1p_exp,%
110     log2,log_determinant,%
111     log_diff_exp,log_falling_factorial,%
112     log_inv_logit,log_mix,%
113     log_rising_factorial,log_softmax,%
114     log_sum_exp,logistic_ccdf_log,%
115     logistic_cdf,logistic_cdf_log,%
116     logistic_log,logistic_rng,%
117     logit,lognormal_ccdf_log,%
118     lognormal_cdf,lognormal_cdf_log,%
119     lognormal_log,lognormal_rng,%
120     machine_precision,max,%
121     mdivide_left_tri_low,mdivide_right_tri_low,%
122     mean,min,%
123     modified_bessel_first_kind,modified_bessel_second_kind,%
124     multi_gp_cholesky_log,multi_gp_log,%
125     multi_normal_cholesky_log,multi_normal_cholesky_rng,%
126     multi_normal_log,multi_normal_prec_log,%
127     multi_normal_rng,multi_student_t_log,%
128     multi_student_t_rng,multinomial_log,%
129     multinomial_rng,multiply_log,%
130     multiply_lower_tri_self_transpose,neg_binomial_2_ccdf_log,%
131     neg_binomial_2_cdf,neg_binomial_2_cdf_log,%
132     neg_binomial_2_log,neg_binomial_2_log_log,%
133     neg_binomial_2_log_rng,neg_binomial_2_rng,%
134     neg_binomial_ccdf_log,neg_binomial_cdf,%
135     neg_binomial_cdf_log,neg_binomial_log,%
136     neg_binomial_rng,negative_infinity,%
137     normal_ccdf_log,normal_cdf,%
138     normal_cdf_log,normal_log,%
139     normal_rng,not_a_number,%
140     num_elements,ordered_logistic_log,%
141     ordered_logistic_rng,owens_t,%
142     pareto_ccdf_log,pareto_cdf,%
143     pareto_cdf_log,pareto_log,%
144     pareto_rng,pareto_type_2_ccdf_log,%
145     pareto_type_2_cdf,pareto_type_2_cdf_log,%
146     pareto_type_2_log,pareto_type_2_rng,%
147     pi,poisson_ccdf_log,%
148     poisson_cdf,poisson_cdf_log,%
149     poisson_log,poisson_log_log,%
150     poisson_log_rng,poisson_rng,%
151     positive_infinity,pow,%
152     prod,qr_Q,%
153     qr_R,quad_form,%
154     quad_form_diag,quad_form_sym,%
155     rank,rayleigh_ccdf_log,%
156     rayleigh_cdf,rayleigh_cdf_log,%

```

```

157 rayleigh_log,rayleigh_rng,%
158 rep_array,rep_matrix,%
159 rep_row_vector,rep_vector,%
160 rising_factorial,round,%
161 row,rows,%
162 rows_dot_product,rows_dot_self,%
163 scaled_inv_chi_square_ccdf_log,scaled_inv_chi_square_cdf,%
164 scaled_inv_chi_square_cdf_log,scaled_inv_chi_square_log,%
165 scaled_inv_chi_square_rng,sd,%
166 segment,sin,%
167 singular_values,sinh,%
168 size,skew_normal_ccdf_log,%
169 skew_normal_cdf,skew_normal_cdf_log,%
170 skew_normal_log,skew_normal_rng,%
171 softmax,sort_asc,%
172 sort_desc,sort_indices_asc,%
173 sort_indices_desc,sqrt,%
174 sqrt2,square,%
175 squared_distance,step,%
176 student_t_ccdf_log,student_t_cdf,%
177 student_t_cdf_log,student_t_log,%
178 student_t_rng,sub_col,%
179 sub_row,sum,%
180 tail,tan,%
181 tanh,tcrossprod,%
182 tgamma,to_array_1d,%
183 to_array_2d,to_matrix,%
184 to_row_vector,to_vector,%
185 trace,trace_gen_quad_form,%
186 trace_quad_form,trigamma,%
187 trunc,uniform_ccdf_log,%
188 uniform_cdf,uniform_cdf_log,%
189 uniform_log,uniform_rng,%
190 variance,von_mises_log,%
191 von_mises_rng,weibull_ccdf_log,%
192 weibull_cdf,weibull_cdf_log,%
193 weibull_log,weibull_rng,%
194 wiener_log,wishart_log,%
195 wishart_rng,bernoulli,%
196 bernoulli_logit,beta,%
197 beta_binomial,binomial,%
198 binomial_logit,categorical,%
199 categorical_logit,cauchy,%
200 chi_square,dirichlet,%
201 double_exponential,exp_mod_normal,%
202 exponential,frechet,%
203 gamma,gaussian_dlm_obs,%
204 gumbel,hypergeometric,%
205 inv_chi_square,inv_gamma,%
206 inv_wishart,lkj_corr,%

```

```

207     lkj_corr_cholesky,logistic,%
208     lognormal,multi_gp,%
209     multi_gp_cholesky,multi_normal,%
210     multi_normal_cholesky,multi_normal_prec,%
211     multi_student_t,multinomial,%
212     neg_binomial,neg_binomial_2,%
213     neg_binomial_2_log,normal,%
214     ordered_logistic,pareto,%
215     pareto_type_2,poisson,%
216     poisson_log,rayleigh,%
217     scaled_inv_chi_square,skew_normal,%
218     student_t,uniform,%
219     von_mises,weibull,%
220     wiener,wishart%
221 },%
222 otherkeywords={<-,~},%
223 sensitive=true,%
224 morecomment=[l]{\#},%
225 morecomment=[l]{//},%
226 morecomment=[n]{*}{*/},%
227 string=[d]"%,
228 literate={<-}{\leftarrow}1 {~}{\sim}1%
229 }

```