

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 coor_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,cbrt,%
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=[1]{\#},%
225 morecomment=[1]{//},%
226 morecomment=[n]{*}{*/},%
227 string=[d]"%,
228 literate={<-}{\leftarrow}1 {~}{\sim}1%
229 }

```

Change History

2015-09-26	General: Converted to DTX file . . . 1	2015-09-28	General: Fix README. Add key- words for all built-in functions that are in Stan v2.8.0. 1
2015-09-27	General: Fix README 1		

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