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 \lstdefinelanguage{BUGS}{
3   morekeywords=[1]{for,in,model,T,I,C},%
4   morecomment=[l]{\#},%
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 \lstdefinelanguage[]{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
2.10.0.

```
16 \lstdefinelanguage{Stan}{
17   morekeywords=[1]{functions,data,parameters,transformed,model,generated,quantities,%
18     for,in,while,print,if,else,lower,upper,increment_log_prob,T,return,%
19     reject,integrate_ode,integrate_ode_bdf,integrate_ode_rk45,target},%
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,%
28     Phi_approx,%
29     abs,%
30     acos,%
31     acosh,%
32     append_col,%
33     append_row,%
34     asin,%
35     asinh,%
36     atan,%
37     atan2,%
38     atanh,%
39     bernoulli_cdf,%
40     bernoulli_cdf_log,%
41     bernoulli_lccdf,%
42     bernoulli_lcdf,%
43     bernoulli_logit_lpmf,%
44     bernoulli_logit_lpmf,%
45     bernoulli_lpmf,%
46     bernoulli_lpmf,%
47     bernoulli_rng,%
48     bessel_first_kind,%
49     bessel_second_kind,%
50     beta_binomial_cdf,%
51     beta_binomial_cdf_log,%
52     beta_binomial_lccdf,%
53     beta_binomial_lcdf,%
54     beta_binomial_lpmf,%
55     beta_binomial_lpmf,%
56     beta_binomial_rng,%
```

```
57    beta_cdf,%
58    beta_cdf_log,%
59    beta_lccdf,%
60    beta_lcdf,%
61    beta_lpdf,%
62    beta_lpdf,%
63    beta_rng,%
64    binary_log_loss,%
65    binomial_cdf,%
66    binomial_cdf_log,%
67    binomial_coefficient_log,%
68    binomial_lccdf,%
69    binomial_lcdf,%
70    binomial_logit_lpmf,%
71    binomial_logit_lpmf,%
72    binomial_lpmf,%
73    binomial_lpmf,%
74    binomial_rng,%
75    block,%
76    categorical_logit_lpmf,%
77    categorical_logit_lpmf,%
78    categorical_lpmf,%
79    categorical_lpmf,%
80    categorical_rng,%
81    cauchy_cdf,%
82    cauchy_cdf_log,%
83    cauchy_lccdf,%
84    cauchy_lcdf,%
85    cauchy_lpdf,%
86    cauchy_lpdf,%
87    cauchy_rng,%
88    cbrt,%
89    ceil,%
90    chi_square_cdf,%
91    chi_square_cdf_log,%
92    chi_square_lccdf,%
93    chi_square_lcdf,%
94    chi_square_lpdf,%
95    chi_square_lpdf,%
96    chi_square_rng,%
97    cholesky_decompose,%
98    col,%
99    cols,%
100   columns_dot_product,%
101   columns_dot_self,%
102   cos,%
103   cosh,%
104   crossprod,%
105   csr_extract_u,%
106   csr_extract_v,%
```

```
107    csr_extract_w,%
108    csr_matrix_times_vector,%
109    csr_to_dense_matrix,%
110    cumulative_sum,%
111    determinant,%
112    diag_matrix,%
113    diag_post_multiply,%
114    diag_pre_multiply,%
115    diagonal,%
116    digamma,%
117    dims,%
118    dirichlet_lpdf,%
119    dirichlet_lpdf,%
120    dirichlet_rng,%
121    distance,%
122    dot_product,%
123    dot_self,%
124    double_exponential_cdf,%
125    double_exponential_cdf_log,%
126    double_exponential_lccdf,%
127    double_exponential_lcdf,%
128    double_exponential_lpdf,%
129    double_exponential_lpdf,%
130    double_exponential_rng,%
131    e,%
132    eigenvalues_sym,%
133    eigenvectors_sym,%
134    erf,%
135    erfc,%
136    exp,%
137    exp2,%
138    exp_mod_normal_cdf,%
139    exp_mod_normal_cdf_log,%
140    exp_mod_normal_lccdf,%
141    exp_mod_normal_lcdf,%
142    exp_mod_normal_lpdf,%
143    exp_mod_normal_lpdf,%
144    exp_mod_normal_rng,%
145    expm1,%
146    exponential_cdf,%
147    exponential_cdf_log,%
148    exponential_lccdf,%
149    exponential_lcdf,%
150    exponential_lpdf,%
151    exponential_lpdf,%
152    exponential_rng,%
153    fabs,%
154    falling_factorial,%
155    fdim,%
156    floor,%
```

```
157    fma,%
158    fmax,%
159    fmin,%
160    fmod,%
161    frechet_cdf,%
162    frechet_cdf_log,%
163    frechet_lccdf,%
164    frechet_lcdf,%
165    frechet_lpdf,%
166    frechet_lpdf,%
167    frechet_rng,%
168    gamma_cdf,%
169    gamma_cdf_log,%
170    gamma_lccdf,%
171    gamma_lcdf,%
172    gamma_lpdf,%
173    gamma_lpdf,%
174    gamma_p,%
175    gamma_q,%
176    gamma_rng,%
177    gaussian_dlm_obs_lpdf,%
178    gaussian_dlm_obs_lpdf,%
179    get_lp,%
180    gumbel_cdf,%
181    gumbel_cdf_log,%
182    gumbel_lccdf,%
183    gumbel_lcdf,%
184    gumbel_lpdf,%
185    gumbel_lpdf,%
186    gumbel_rng,%
187    head,%
188    hypergeometric_lpmf,%
189    hypergeometric_lpmf,%
190    hypergeometric_rng,%
191    hypot,%
192    if_else,%
193    inc_beta,%
194    int_step,%
195    inv,%
196    inv_chi_square_cdf,%
197    inv_chi_square_cdf_log,%
198    inv_chi_square_lccdf,%
199    inv_chi_square_lcdf,%
200    inv_chi_square_lpdf,%
201    inv_chi_square_lpdf,%
202    inv_chi_square_rng,%
203    inv_cloglog,%
204    inv_gamma_cdf,%
205    inv_gamma_cdf_log,%
206    inv_gamma_lccdf,%
```

```
207    inv_gamma_lcdf,%
208    inv_gamma_lpdf,%
209    inv_gamma_lpdf,%
210    inv_gamma_rng,%
211    inv_logit,%
212    inv_phi,%
213    inv_sqrt,%
214    inv_square,%
215    inv_wishart_lpdf,%
216    inv_wishart_lpdf,%
217    inv_wishart_rng,%
218    inverse,%
219    inverse_spd,%
220    is_inf,%
221    is_nan,%
222    lbeta,%
223    lchoose,%
224    lgamma,%
225    lkj_corr_cholesky_lpdf,%
226    lkj_corr_cholesky_lpdf,%
227    lkj_corr_cholesky_rng,%
228    lkj_corr_lpdf,%
229    lkj_corr_lpdf,%
230    lkj_corr_rng,%
231    lmgamma,%
232    lmultiply,%
233    log,%
234    log10,%
235    log1m,%
236    log1m_exp,%
237    log1m_inv_logit,%
238    log1p,%
239    log1p_exp,%
240    log2,%
241    log_determinant,%
242    log_diff_exp,%
243    log_falling_factorial,%
244    log_inv_logit,%
245    log_mix,%
246    log_rising_factorial,%
247    log_softmax,%
248    log_sum_exp,%
249    logistic_cdf,%
250    logistic_cdf_log,%
251    logistic_lccdf,%
252    logistic_lcdf,%
253    logistic_lpdf,%
254    logistic_lpdf,%
255    logistic_rng,%
256    logit,%
```

```
257    lognormal_cdf,%
258    lognormal_cdf_log,%
259    lognormal_lccdf,%
260    lognormal_lcdf,%
261    lognormal_lpdf,%
262    lognormal_lpdf,%
263    lognormal_rng,%
264    machine_precision,%
265    max,%
266    mdivide_left_tri_low,%
267    mdivide_right_tri_low,%
268    mean,%
269    min,%
270    modified_bessel_first_kind,%
271    modified_bessel_second_kind,%
272    multi_gp_cholesky_lpdf,%
273    multi_gp_cholesky_lpdf,%
274    multi_gp_lpdf,%
275    multi_gp_lpdf,%
276    multi_normal_cholesky_lpdf,%
277    multi_normal_cholesky_lpdf,%
278    multi_normal_cholesky_rng,%
279    multi_normal_lpdf,%
280    multi_normal_lpdf,%
281    multi_normal_prec_lpdf,%
282    multi_normal_prec_lpdf,%
283    multi_normal_rng,%
284    multi_student_t_lpdf,%
285    multi_student_t_lpdf,%
286    multi_student_t_rng,%
287    multinomial_lpmf,%
288    multinomial_lpmf,%
289    multinomial_rng,%
290    multiply_log,%
291    multiply_lower_tri_self_transpose,%
292    neg_binomial_2_cdf,%
293    neg_binomial_2_cdf_log,%
294    neg_binomial_2_lccdf,%
295    neg_binomial_2_lcdf,%
296    neg_binomial_2_log_lpmf,%
297    neg_binomial_2_log_lpmf,%
298    neg_binomial_2_log_rng,%
299    neg_binomial_2_lpmf,%
300    neg_binomial_2_lpmf,%
301    neg_binomial_2_rng,%
302    neg_binomial_cdf,%
303    neg_binomial_cdf_log,%
304    neg_binomial_lccdf,%
305    neg_binomial_lcdf,%
306    neg_binomial_lpmf,%
```

```
307     neg_binomial_lpmf,%
308     neg_binomial_rng,%
309     negative_infinity,%
310     normal_cdf,%
311     normal_cdf_log,%
312     normal_lccdf,%
313     normal_lcdf,%
314     normal_lpdf,%
315     normal_lpdf,%
316     normal_rng,%
317     not_a_number,%
318     num_elements,%
319     ordered_logistic_lpmf,%
320     ordered_logistic_lpmf,%
321     ordered_logistic_rng,%
322     owens_t,%
323     pareto_cdf,%
324     pareto_cdf_log,%
325     pareto_lccdf,%
326     pareto_lcdf,%
327     pareto_lpdf,%
328     pareto_lpdf,%
329     pareto_rng,%
330     pareto_type_2_cdf,%
331     pareto_type_2_cdf_log,%
332     pareto_type_2_lccdf,%
333     pareto_type_2_lcdf,%
334     pareto_type_2_lpdf,%
335     pareto_type_2_lpdf,%
336     pareto_type_2_rng,%
337     pi,%
338     poisson_cdf,%
339     poisson_cdf_log,%
340     poisson_lccdf,%
341     poisson_lcdf,%
342     poisson_log_lpmf,%
343     poisson_log_lpmf,%
344     poisson_log_rng,%
345     poisson_lpmf,%
346     poisson_lpmf,%
347     poisson_rng,%
348     positive_infinity,%
349     pow,%
350     prod,%
351     qr_Q,%
352     qr_R,%
353     quad_form,%
354     quad_form_diag,%
355     quad_form_sym,%
356     rank,%
```

```
357      rayleigh_cdf,%
358      rayleigh_cdf_log,%
359      rayleigh_lccdf,%
360      rayleigh_lcdf,%
361      rayleigh_lpdf,%
362      rayleigh_lpdf,%
363      rayleigh_rng,%
364      rep_array,%
365      rep_matrix,%
366      rep_row_vector,%
367      rep_vector,%
368      rising_factorial,%
369      round,%
370      row,%
371      rows,%
372      rows_dot_product,%
373      rows_dot_self,%
374      scaled_inv_chi_square_cdf,%
375      scaled_inv_chi_square_cdf_log,%
376      scaled_inv_chi_square_lccdf,%
377      scaled_inv_chi_square_lcdf,%
378      scaled_inv_chi_square_lpdf,%
379      scaled_inv_chi_square_lpdf,%
380      scaled_inv_chi_square_rng,%
381      sd,%
382      segment,%
383      sin,%
384      singular_values,%
385      sinh,%
386      size,%
387      skew_normal_cdf,%
388      skew_normal_cdf_log,%
389      skew_normal_lccdf,%
390      skew_normal_lcdf,%
391      skew_normal_lpdf,%
392      skew_normal_lpdf,%
393      skew_normal_rng,%
394      softmax,%
395      sort_asc,%
396      sort_desc,%
397      sort_indices_asc,%
398      sort_indices_desc,%
399      sqrt,%
400      sqrt2,%
401      square,%
402      squared_distance,%
403      step,%
404      student_t_cdf,%
405      student_t_cdf_log,%
406      student_t_lccdf,%
```

```
407    student_t_lcdf,%
408    student_t_lpdf,%
409    student_t_lpdf,%
410    student_t_rng,%
411    sub_col,%
412    sub_row,%
413    sum,%
414    tail,%
415    tan,%
416    tanh,%
417    tcrossprod,%
418    tgamma,%
419    to_array_1d,%
420    to_array_2d,%
421    to_matrix,%
422    to_row_vector,%
423    to_vector,%
424    trace,%
425    trace_gen_quad_form,%
426    trace_quad_form,%
427    trigamma,%
428    trunc,%
429    uniform_cdf,%
430    uniform_cdf_log,%
431    uniform_lccdf,%
432    uniform_lcdf,%
433    uniform_lpdf,%
434    uniform_lpdf,%
435    uniform_rng,%
436    variance,%
437    von_mises_lpdf,%
438    von_mises_lpdf,%
439    von_mises_rng,%
440    weibull_cdf,%
441    weibull_cdf_log,%
442    weibull_lccdf,%
443    weibull_lcdf,%
444    weibull_lpdf,%
445    weibull_lpdf,%
446    weibull_rng,%
447    wiener_lpdf,%
448    wiener_lpdf,%
449    wishart_lpdf,%
450    wishart_lpdf,%
451    wishart_rng
452    },%
453    otherkeywords={<-,~,+=,=},%
454    sensitive=true,%
455    morecomment=[l]{\#},%
456    morecomment=[l]{//},%
```

```
457   morecomment=[n]{/*}{*/},%
458   string=[d]"%,
459   literate={<-}{{$\leftarrow$}}1 {~}{{$\sim$}}1%
460 }
```

Change History

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