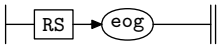
1. *knu1* **Grammar.**
Test out (24) grammar from Knuth's paper: "On the Translation of languages from left to right" from Information and control, vol. 8 of 6, pages 607–639, 1965.

2. **Fsm Cknu1 class.**

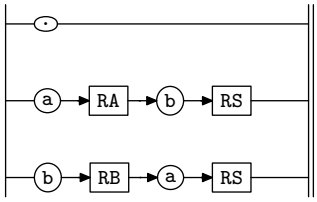
3. *Rstart* **rule.**

Rstart



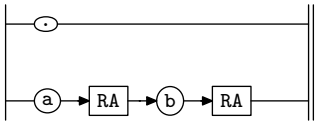
4. RS **rule.**

RS



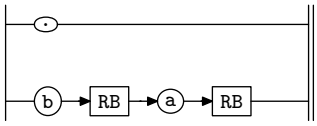
5. RA **rule.**

RA



6. RB **rule.**

RB



7. First Set Language for O_2^{linker}.

```
/*
 File: knu1.fsc
 Date and Time: Mon Sep 15 20:09:19 2014
*/
transitive   n
grammar-name "knu1"
name-space   "NS_knu1"
thread-name  "Cknu1"
monolithic   y
file-name    "knu1.fsc"
no-of-T      569
list-of-native-first-set-terminals 3
   LR1_eog
   raw_a
   raw_b
end-list-of-native-first-set-terminals
list-of-transitive-threads 0
end-list-of-transitive-threads
list-of-used-threads 0
end-list-of-used-threads
fsm-comments
"knuth grammar (24)"
```

8. Lr1 State Network.

⇒ State: 1 state type: $^{s/r}$

←	rule	→	R#	sr#	Po	←	subrule element	→	Brn	Gto	Red	LA
c	RS		2	1	1	ϵ			1	0	1	1
c	RS		2	2	1	a			1	2	9	
c	RS		2	3	1	b			1	5	8	
c	Rstart		1	1	1	RS *eog*			1	10	11	

$\Rightarrow^{a}$ State: 2 state type: $^{s/r}$

←	rule	→	R#	sr#	Po	←	subrule element	→	Brn	Gto	Red	LA
c	RA		3	1	1	ϵ			2	0	2	2
c	RA		3	2	1	a			2	12	15	
t	RS		2	2	2	RA *b*			1	3	9	

$\Rightarrow^{RA}$ State: 3 state type: ^{s}

←	rule	→	R#	sr#	Po	←	subrule element	→	Brn	Gto	Red	LA
t	RS		2	2	3	b			1	4	9	

$\Rightarrow^{b}$ State: 4 state type: $^{s/r}$

←	rule	→	R#	sr#	Po	←	subrule element	→	Brn	Gto	Red	LA
c	RS		2	1	1	ϵ			4	0	4	1
c	RS		2	2	1	a			4	2	9	
c	RS		2	3	1	b			4	5	8	
t	RS		2	2	4	RS			1	9	9	

$\Rightarrow^{b}$ State: 5 state type: $^{s/r}$

←	rule	→	R#	sr#	Po	←	subrule element	→	Brn	Gto	Red	LA
c	RB		4	1	1	ϵ			5	0	5	3
c	RB		4	2	1	b			5	16	19	
t	RS		2	3	2	RB *a*			4	6	8	

$\Rightarrow^{RB}$ State: 6 state type: ^{s}

←	rule	→	R#	sr#	Po	←	subrule element	→	Brn	Gto	Red	LA
t	RS		2	3	3	a			4	7	8	

$\Rightarrow^{a}$ State: 7 state type: $^{s/r}$

←	rule	→	R#	sr#	Po	←	subrule element	→	Brn	Gto	Red	LA
c	RS		2	1	1	ϵ			7	0	7	1
c	RS		2	2	1	a			7	2	9	
c	RS		2	3	1	b			7	5	8	
t	RS		2	3	4	RS			4	8	8	

$\Rightarrow^{RS}$ State: 8 state type: ^{r}

←	rule	→	R#	sr#	Po	←	subrule element	→	Brn	Gto	Red	LA
t	RS		2	3	5				4	0	8	1

$\Rightarrow^{RS}$ State: 9 state type: ^{r}

←	rule	→	R#	sr#	Po	←	subrule element	→	Brn	Gto	Red	LA
t	RS		2	2	5				1	0	9	1

$\Rightarrow^{RS}$ State: 10 state type: ^{s}

←	rule	→	R#	sr#	Po	←
t	Rstart		1	1	2	eog

← subrule element	→	Brn	Gto	Red	LA
		1	11	11	

$\Rightarrow^{eog}$

State: 11 state type: ^{r}

←	rule	→	R#	sr#	Po	←
t	Rstart		1	1	3	

← subrule element	→	Brn	Gto	Red	LA
		1	0	11	4

$\Rightarrow^{a}$

State: 12 state type: $^{s/r}$

←	rule	→	R#	sr#	Po	←
c	RA		3	1	1	ϵ
c	RA		3	2	1	a
t	RA		3	2	2	RA $\underline{b}$

← subrule element	→	Brn	Gto	Red	LA
		12	0	12	2
		12	12	15	
		2	13	15	

$\Rightarrow^{RA}$

State: 13 state type: ^{s}

←	rule	→	R#	sr#	Po	←
t	RA		3	2	3	b

← subrule element	→	Brn	Gto	Red	LA
		2	14	15	

$\Rightarrow^{b}$

State: 14 state type: $^{s/r}$

←	rule	→	R#	sr#	Po	←
c	RA		3	1	1	ϵ
c	RA		3	2	1	a
t	RA		3	2	4	RA

← subrule element	→	Brn	Gto	Red	LA
		14	0	14	2
		14	12	15	
		2	15	15	

$\Rightarrow^{RA}$

State: 15 state type: ^{r}

←	rule	→	R#	sr#	Po	←
t	RA		3	2	5	

← subrule element	→	Brn	Gto	Red	LA
		2	0	15	2

$\Rightarrow^{b}$

State: 16 state type: $^{s/r}$

←	rule	→	R#	sr#	Po	←
c	RB		4	1	1	ϵ
c	RB		4	2	1	b
t	RB		4	2	2	RB $\underline{a}$

← subrule element	→	Brn	Gto	Red	LA
		16	0	16	3
		16	16	19	
		5	17	19	

$\Rightarrow^{RB}$

State: 17 state type: ^{s}

←	rule	→	R#	sr#	Po	←
t	RB		4	2	3	a

← subrule element	→	Brn	Gto	Red	LA
		5	18	19	

$\Rightarrow^{a}$

State: 18 state type: $^{s/r}$

←	rule	→	R#	sr#	Po	←
c	RB		4	1	1	ϵ
c	RB		4	2	1	b
t	RB		4	2	4	RB

← subrule element	→	Brn	Gto	Red	LA
		18	0	18	3
		18	16	19	
		5	19	19	

$\Rightarrow^{RB}$

State: 19 state type: ^{r}

←	rule	→	R#	sr#	Po	←
t	RB		4	2	5	

← subrule element	→	Brn	Gto	Red	LA
		5	0	19	3

9. Index.

ϵ : 4, 5, 6.
eog: 3.
knu1: 1.
RA: 4, 5.
RA: 5.
RB: 4, 6.
RB: 6.
RS: 3, 4.
RS: 4.
Rstart: 3.

knu1 Grammar

Date: September 16, 2014 at 14:56

File: knu1.lex

Ns: NS_knu1

Version: 1.0 Debug: true

Grammar Comments: Type: Monolithic

knuth grammar (24)

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