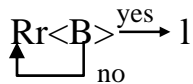


計算の理論 II 出席チェック兼用ミニテスト用紙 2004年11月15日	学籍番号	
	名前	

**問題**

資料の Turing 機械  $R$  を  $R, r, \langle B \rangle, l$  から合成して作り出せ。なお、最終的に定義式の形で示すこと。

$r = (\{q_0, q_h\}, \{B, 1\}, K_1, q_0, \{q_h\})$ ,  $K_1 = \{q_0BBRq_h, q_011Rq_h\}$   
 $\langle B \rangle = (\{p_0, p_1, p_h\}, \{B, 1\}, K_2, p_0, \{p_1, p_h\})$ ,  $K_2 = \{p_0BBNp_h, p_011Np_1\}$   
 $R = (Q, \{B, 1\}, K_3, r_0, F)$ ,  $Q = \{r_0, r_1, r_2, r_3, r_4\}$ ,  
 $K_3 = \{r_0BBRr_1, r_011Rr_1, r_2BBNr_4, r_211Nr_3, r_1BBNr_2, r_111Nr_2, r_311Nr_0\}$ ,  $F = \{r_4\}$   
 $l = (\{s_0, s_h\}, \{B, 1\}, K_4, s_0, \{s_h\})$ ,  $K_4 = \{s_0BBLs_h, s_011Ls_h\}$



$Rr = (\{q_0, q_h, r_0, r_1, r_2, r_3, r_4\}, \{B, 1\}, K_5, r_0, \{q_h\})$ ,  
 $K_5 = K_3 \cup K_1 \cup \{r_4BBNq_0, r_411Nq_0\} = \{r_0BBRr_1, r_011Rr_1, r_2BBNr_4, r_211Nr_3, r_1BBNr_2, r_111Nr_2, r_311Nr_0, q_0BBRq_h, q_011Rq_h, r_4BBNq_0, r_411Nq_0\}$

$Rr\langle B \rangle = (\{q_0, q_h, r_0, r_1, r_2, r_3, r_4, p_0, p_1, p_h\}, \{B, 1\}, K_6, r_0, \{p_h\})$ ,  
 $K_6 = K_5 \cup K_2 \cup \{q_hBBNp_0, q_h11Np_0\} = \{r_0BBRr_1, r_011Rr_1, r_2BBNr_4, r_211Nr_3, r_1BBNr_2, r_111Nr_2, r_311Nr_0, q_0BBRq_h, q_011Rq_h, r_4BBNq_0, r_411Nq_0, p_0BBNp_h, p_011Np_1, q_hBBNp_0, q_h11Np_0\}$

以上より、最終的に  $R$  は、

$R = (\{q_0, q_h, r_0, r_1, r_2, r_3, r_4, p_0, p_1, p_h, s_0, s_h\}, \{B, 1\}, K_7, r_0, \{s_h\})$

$K_7 = K_6 \cup K_4 \cup \{p_hBBNs_0, p_h11Ns_0\}$

$= \{r_0BBRr_1, r_011Rr_1, r_2BBNr_4, r_211Nr_3, r_1BBNr_2, r_111Nr_2, r_311Nr_0, q_0BBRq_h, q_011Rq_h, r_4BBNq_0, (r_411Nq_0), p_0BBNp_h, p_011Np_1, q_hBBNp_0, q_h11Np_0, p_0BBNr_0, s_0BBLs_h, s_011Ls_h, p_hBBNs_0, (p_h11Ns_0)\}$

となる。  $r_411Nq_0$  と  $p_h11Ns_0$  はなくてもよい