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摘要 4 ¿ 3 î m¥ V ñ î ÿ H ½ B Á Ÿ £ Z E n 5 V V ñ ¥ H W ý T @ © y 3 î m [m™ Ä Z T V r L è V ? Ü V ¥ ^ á „ H W • î ÿ _ © H G X Ü › î î 3 î m É › † s ÷ • æ ¨ m Ĩ « Ä M 1 • É › H W Ÿ • ¥ £ ¾ Z E V [³ % ' ÷ ÿ • f f / V ñ H ½ B Á Ÿ î ÿ £ Û 5 7 O ? ç Ê ~ Ĩ Û 5 ¥ ^ á . • ¨ ¼ É › ý T @ H ½ s È) Ø ª Ä ý T @ ~ 6 B Z ë 3 î m V ñ H ½ Ÿ • É › £ P ¨ µ z ¥ V x ¨ Ÿ

关键词 H W ý T @ © 3 î m H ½ Ÿ • V ñ î ÿ £

中图分类号 文献标识码 文章编号

A Sprouting Graph Based Approach to Dynamic Check the Temporal Consistency of Workflow Multi Process

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Abstract:

!! " ## \$ % ! & " % (& & & " (! * & " & † , !) † , (¨ ~ ! & " ¨ " ! " ## & " & " % + ! (" - - " (! % * ! + (¨ ~ ! & , & % & \$ " " % " (! * † (" ! ! + , !) † , " & # & † (" . & % ¨ , " (! * & " " & & % , % " " ! " # & & % # " ! " " (! * † (" ! ! + & & (* % & / " % & &) " " (! * & " " \$ % ! " " (! * ~ † (" ! " ! " ## (" ! % & ! " ! * & % (& & & " " (! * & " & † & & " , !) † , , " ! & & " " \$ " * ! # / " " / ! " # " & " " , & + * " ! & & " ! % # % (! % † # , !) † , (! % * " (! " \$ * (* ! " ## & \$ % \$ (! " ! " (! * & " "

Key words: " (, !) † , " ! " ## " (! * & " " (¨ ~ ! & % (& & &) #

1 引言

® ¿ ý T @ ¥ ³ › Y È # ñ • Ð € „ Œ ' ÷ ^ ¿ s ò Œ s È y í Ä y N y H Y V á y £ ¥ H ½ Ÿ • 9 í E £ ³ › ¨ B ° û i @ V ? C ò Œ s È . À L è í E ? Ä ³ › ¹ ² y N ý T @ ³ › V ñ Ĩ î ÿ £ _ © . ¥ H ½ Ÿ • ´ Q , B Á ¿ < < ¥ ž ' ³ › µ × 1 i | ¹ ²

C ¨ S = " X Ü C Œ î ÿ £ Z E ¹ ³ ² Ó D 1 2 | M H W Ä ¹ ' H W L è ³ › ¨ : c - ½ î ¥ ² • H W x • 9 Ø ª Ä î ¥ › î H W V 7 L C î ÿ ¥ H ½ £ Y V „ Æ E e Ä Ä " † Ó

D 1 2 e Ä Ä " † Ĩ í í ¥ î ÿ 9 h î ÿ _ © . ¥ H ½ Ÿ • ´ Q Ó D 1 4 2 ó B Œ ¿ î ³ › H W ¥ î ÿ _ © Ä ! Ä Z E - ª Œ ,] ¥ H ½ Ÿ • 4 ,] ¥ £ s Z E Ó D 1 2 | ý T @ m ¨ ¹ 5 \$ m ¢ \$ m ¢ , + m „ 5, m i æ ¨ f ¹ Œ m ¥ 1 o ^ á © Ä ù K H ½ Ÿ • É › î ÿ £ Œ © ì ý T @ ¥ - Ÿ Ó D 1 2 ¹ © Ä ù K H ½ Ÿ • „ Æ ¹ Œ • Ÿ < B Á Ÿ a Ð B Á Ÿ a Ð , B Á Ÿ „ < , B Á Ÿ i f t Ÿ 4 M ¨ ¥ î ÿ £ Z E Ó D 1 2 s ñ © Ä ù K H ½ Ÿ • - W ¥ G ¹ " - ª 4 î ÿ £ Z E Y V s ý T @ V ñ ¥ ' ÷ ÿ • f ¨ Ó D 1 2 4 B Œ ' ÷ ÿ • / V ñ ¥ î ÿ H ½ B Á Ÿ £ Z E

$\mathbb{I}, | \frac{3}{4} = \text{í F M}^1 (\text{" ? " } \odot \text{" ? " }_a, (\text{" ? " } \cup (\text{" ? " }_a), \text{í } \otimes \text{í } \frac{1}{2} \} (t_i, [d(t_i) \text{ } \mathcal{A} \mathcal{D}(t_i)])$.

7 : $\hat{A} T, \text{í } \llcorner \text{Ä node } \tilde{p}(P_z)(x \leq z \leq y), 57 y B \tilde{n} \bullet \llcorner \text{Ä, !}$
 $= \text{í F}^1 (\text{" ? " } (\text{" ? " }), \text{í V node } \tilde{p}(P_j)(s \leq j \leq r) y \hat{e}$
 $\hat{z} \frac{3}{4} \llcorner \text{Ä } \neq \mu _ \mathbb{I}, \text{í } \otimes \text{í } \frac{1}{2} \} (t_i, [d(t_i) \text{ } \mathcal{A} \mathcal{D}(t_i)])$.

$\text{" } \zeta : V Q \tilde{\text{í }} \div \text{" } t_i, \hat{A} T Q > \Phi, \emptyset E^2 \bullet. \hat{Z} 5, \hat{E} | / B \tilde{n} M \%$
 $\text{í } \hat{z} \text{" } \zeta$.

• $y \emptyset E \ddot{o} 1 \rangle \hat{\text{í }} Z \ddot{e} \acute{y} T: B Z \ddot{e}, \hat{z}$
 $Q \tilde{\text{í }} M \% V ? \text{í } B \tilde{n} \quad \tilde{n} \{ \mathcal{A} E (\quad) \circ \hat{\text{í }}, \mathcal{A} E$
 $,] f f \bullet \text{" } \zeta | \text{" } 4 \tilde{\text{í }} \neq H W \text{" } ^ \hat{a} T \acute{E} \rangle 9$
 $\emptyset, \text{í } O Y V 3 \hat{\text{í }} m \llcorner \text{Ä} \bullet \quad \acute{o} \emptyset V r, 8 n \text{" } \zeta$

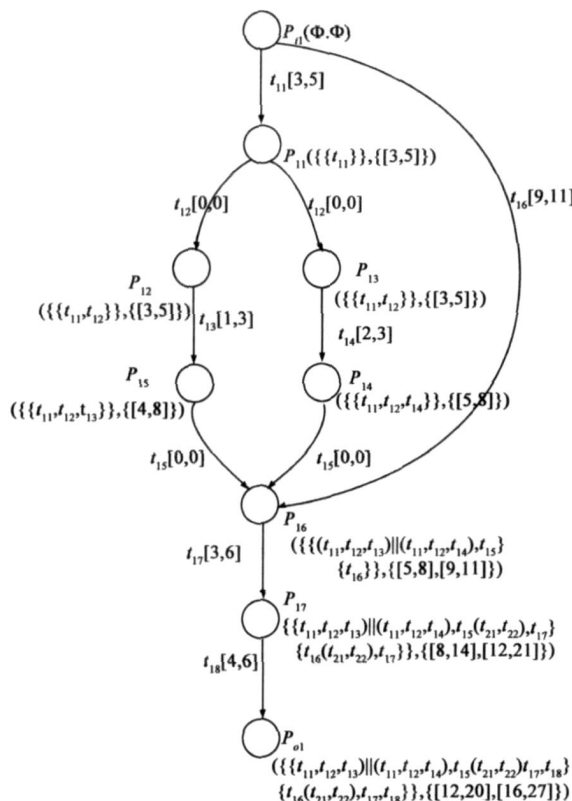


图2 实例模型的生成图

4 基于生成图的动态验证

$\hat{\text{í }} \ddot{y} \quad \mathcal{E} Y \acute{E} ? 3 \quad \zeta 5 ! \zeta \neq _ \odot H Y \in$
 $\sim M \llcorner \neq \ddot{y}, N H \acute{y} T @ \text{" } d X \ddot{U} \rangle B H W$
 $' \sim \tilde{\text{í }} \dagger s H W M X \ddot{U}' \zeta. \text{" } -, 1 \hat{z} \hat{\text{í }} \ddot{y} _ \odot$
 $H \neq \acute{E} 4 \text{í } \quad \ddot{O} Z T^{/4}. ' \acute{O}, \quad \sim \tilde{\text{í }} \hat{\text{í }} \ddot{y} _$
 $\odot \text{Ä} \neq ! \zeta \ddot{U} 5 \acute{E} \rangle V \quad) , .$
 $L ! \text{" } d \rangle \hat{z} \hat{\text{í }} \ddot{y} _ \odot \text{Ä} (H Y H) H, \quad \hat{z} X$
 $\ddot{U} \rangle \hat{\text{í }} \hat{\text{í }} \neq^3 \rangle H W \quad 3 \hat{\text{í }} m \tilde{\text{í }} M \llcorner \llcorner \text{Ä} \neq H W$
 $\bullet \quad \acute{E} \rangle \div \bullet.$

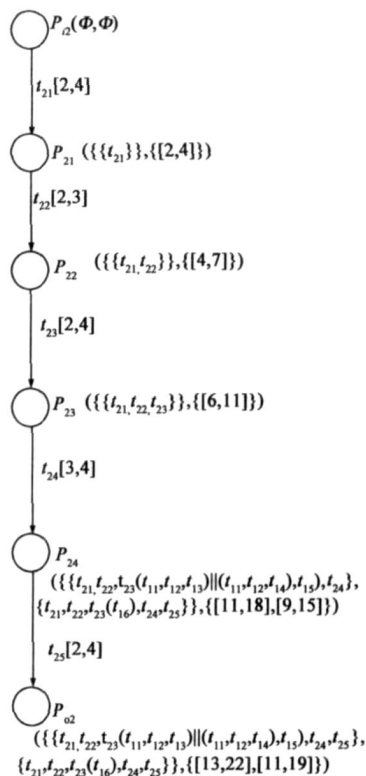
算法2 生成图的动态更新算法

输入: $3 \hat{\text{í }} m G \text{" } M \% \frac{1}{2} Q$

输出: $\div \bullet \text{" } \neq 3 \hat{\text{í }} m G$

$\text{" } \text{" } \zeta 4 6 B Z \ddot{e}, \quad \hat{z} M \% W' \div M 1 f \text{ } ^{\text{TM}} \hat{o}$
 $\text{" } 5 \ddot{Y} 5 \rangle \text{" } \ddot{o} 5 \acute{E} \rangle) \emptyset, 8 n \text{" } \zeta \quad V \bullet. !$
 $- \quad \sim \tilde{\text{í }} M \% \neq \tilde{n} \text{" } n, \quad ^ \wedge A \quad \emptyset E \quad \neq \text{" } K$
 $\mu f f / \text{" } O(n) (9 \text{" } \text{" } \zeta \quad \tilde{\text{í }}, \text{Ä} \tilde{n} M \% \hat{u} \emptyset$
 $\tilde{n} n ? \quad M \% \text{í } \quad \text{" } \div \ddot{y} \bullet).$

$\hat{e} \hat{A} m \quad \tilde{\text{í }} \quad \sim, G \quad \emptyset E \quad , y \ddot{e} o \hat{\text{í }} p_i \text{" } p_i$
 $\llcorner \neq \hat{o} \llcorner \text{Ä, \text{í } s Y } \otimes \text{í } = \text{í F} (\Phi, \Phi). \quad V Q \tilde{\text{í }} 4 |$
 $\gg B \tilde{n} M \% t, \mathcal{A} E \quad t \{ \quad \text{" } \circ \hat{\text{í }} p, \quad / p \quad \llcorner \neq \llcorner$
 $\text{Ä, \text{í } } \otimes \text{í } = \text{í F} (\{ t \}, [\quad, 4 \rangle),] H \div \text{" } t.] \emptyset,$
 $Q \tilde{\text{í }} \neq \quad \tilde{n} M \% \acute{E} \rangle) \emptyset, V 7 V [\quad \acute{\alpha} \hat{z} 3 \hat{\text{í }} m \hat{A} m$
 $\hat{\text{í }} U.$



$\text{" } \zeta : ! M \% t_{xy} \in W_{\kappa} \quad H Y H P ?, O 7 S P ? H W H_{xy}, \ddot{U} \mathbb{I} \text{ arc}$
 $t(t_{xy}) \neq H W [d(t_{xy}) \text{ } \mathcal{A} \mathcal{D}(t_{xy})] \hat{z}^1 [d(t_{xy}) ? (H ? H_{xy}), D(t_{xy})$
 $? (H ? H_{xy})],] H | \quad \text{arc } t(t_{xy}) \{ \mathcal{A} E \llcorner \text{Ä} \neq H W \text{" } \tilde{\text{í }} \text{í } \hat{\text{í }} \hat{u}$
 $\hat{z}^1 [\quad, \quad]$.

$\text{" } \zeta : V Q \tilde{\text{í }} \div \text{" } X (\text{" } M \% \text{í } V Q \tilde{\text{í }} \acute{E} | \gg B \tilde{n} \text{í } \hat{\text{í }} t_{\hat{p}} \in W_i$

$\text{" } \zeta : ! t_{\hat{p}} \{ \mathcal{A} E \circ \hat{\text{í }}^1 P_s, \dots, P_r, \text{node } \tilde{p}(P_j) \neq H W \text{" }^1 (\text{" } ? \text{" }_j (s$
 $\leq j \leq r), \emptyset t_{\hat{p}} \text{" } \div M 1 \neq M \% \text{" } \dagger S D(t_{\hat{p}}), 9 \emptyset P ? H W u$
 $W P B(t_{\hat{p}}) > (\text{" } ? \text{" }_s \diamond, \dots, \diamond (\text{" } ? \text{" }_r)$.

7 : $\hat{A} T S D(t_{\hat{p}}) > \Phi, (\text{" } ? \text{" }_{\hat{p}} > P B(t_{\hat{p}}) \blacktriangle [d(t_{\hat{p}}) \text{ } \mathcal{A} \mathcal{D}(t_{\hat{p}})]$.

7 : $\hat{A} T S D(t_{\hat{p}}) \neq \Phi, \mathcal{A} E \quad t_j \in S D(t_i), ! t_j \{ \mathcal{A} E \circ \hat{\text{í }} P_m, \dots, P_n,$
 $\text{node } \tilde{p}(P_k) \neq H W \text{" } ^ \wedge (\text{" } ? \text{" }_j (m \leq j \leq n), 9 \emptyset P B(t_j) >$
 $(\text{" } ? \text{" }_m \diamond, \dots, \diamond (\text{" } ? \text{" }_n) \quad \hat{z}^* [a, b] \in P B(t_{\hat{p}}), ^* [c,$
 $d] \in P B(t_{\hat{p}}), \hat{A} T a B c, \text{í } \hat{\text{í }} [a, b] \div \hat{z}^1 [(0 [c @ d(t_{\hat{p}}),$
 $a], (0 [d @ D(t_{\hat{p}}), b]]) \quad -^a 9 \emptyset (\text{" } ? \text{" }_{\hat{p}} > P B(t_{\hat{p}}) \blacktriangle [d$

$$(t_{ip}) \mathfrak{A} (t_{ip})].$$

„ $\zeta : \mathbb{C} \rightarrow \text{arc} t(t_{\varphi}) \neq \{ \text{« } \ddot{A}, \bullet \text{ » } (? \text{ » } \varphi \text{ » } \ddot{A} \ddot{I} \neq \text{HW} \text{ »}$

$$,, \zeta 4: \div " t_{ip}, \hat{A} T Q > \Phi, G \rangle \hat{i} H W \bullet \div \bullet; \check{Z} 5 \check{z} ,, \zeta .$$
$$\begin{aligned} & V \quad V[A, \emptyset E \quad G \quad X) \quad \hat{1} \quad \hat{1} \neq HW \\ Q \quad \ddot{I} \quad \ddot{A} (\quad ? \neq M \% \dot{E} \quad HW \bullet \quad \neq x \bullet 9 \quad \emptyset, \ddot{A} \quad M \\ & (\quad ^\wedge \quad \hat{a} \bullet \quad \dot{E} \quad) \div \quad \dot{\iota} \cdot L ! \quad - \quad \sim \quad \ddot{I} \quad o \quad \hat{1} \quad ,, \quad M \% \neq \\ & \ddot{n} \quad " \quad s \quad Y^1 \quad m \quad ,, \quad n_s \quad \emptyset E \quad \neq \quad ^{-1} \quad K \mu f \quad f / \quad ^{-1} \quad O \\ & (n). \end{aligned}$$
$$\begin{aligned} & \text{L ! } \hat{y} _ \text{ @HY}^1 H, \text{ i } \text{ O G X } \ddot{U} \hat{y} \div \bullet, \ddot{y} \\ & \bullet D_R(t_i, t_j) \leq p \neq \hat{y} \ \varepsilon \vee \tilde{n} \hat{A} / . n 5, \vee G \tilde{I}^\circ \\ & \text{arc} \tilde{t}(t_j) \{ \quad \ll \tilde{A} \neq H W" \quad (\ ? \ " _j . -^a, \hat{o} \ t_i \wedge \\ & \check{Z} P ? \quad (\ ? s f^{\text{TM}}) \ , \end{aligned}$$

» B Œ f L ! t_i X P ? (? . ! t_i P ? H Y
S, ° [a , b] ∈ (? " j : Â T p ? H C a ? S, a ü H
W y • , ? i @ R í [a , b] î ‹ ¥ " ? " j Ĩ ¥ ^
â , Y © ¨ ¼ • | M (÷ E É › Ø ³ Ä Ç ; Â T b ? S
≤_p ? H , H W y • i @ ñ f ^a ü N H , ? ' ç H
W y • ^ Ž i @

» = Öf f L! t_i À µ P? (? . ° arc t(t_i) {
Æ« Ä ¥ H W" (? "i, ° [c, d] ∈ (? "i ,
° [a, b] ∈ (? "j: Â T p C a? d, a ü H Wÿ • ,
? i @ R í [a, b] î ‹ ¥ " ? "j İ ¥ ^ â, Y ©
· ¼ • | M ‹ ÷ E É › Ø³ Ä ç; Â T b? c ≤ p, H W
ÿ • i @ ñ f f a ü N H, ? ' ç H Wÿ • ^ Ž
i @

ħ ý T @³ › H ¥ s È, V Y V s ý T @V
 ñ Ô I, a' Ø œ ý T @³ › †, P ý T @L è j @
 H ½ ÿ •. 6 “, 9 V, ¥ S ¶ = ê ^ â ª Ã ¥
 î (? H W F Å ³ ›, ¹ ª Ã î = µ @ H
 W V 7 P L è j @M (¥ H ½ ÿ •.

5 实例分析

L! < i i Õ i > @ñ^[1]: • Á Ö 7 ? Å
/ @ñ # ø Á Ö ¿ / @ñ.

() • Á Ö 7 ? Å / @ñ: Y V < ù ? „ g r t
Ê ¥ Ø ù ! 9, -^a ® 9 ý ñ = , , © ¿^a, 4 Æ 3 Á
† Ê Ê › • Á Ö Å / ; 6 “ B Ö f f ^ ° ¨ ® ñ ù
? † Ê Ê › ! 9, -^a , , © ¿^a Ê › Å / . ø Á Ö ¿
/ @ñ: ù ? † Ê Ê › Ø ù, ø Á Ö ¿ / á „ / Æ s
, -^a ® 9 ý ñ = , , » , K^a ó 3 Á † Ê Ê ›
¿ Ê^a ¥ ø Á Ö Å / .

() m ī • Á Ö 7 ? Å / @ñ ĭ M %,, Ê Â c
l : p_i @ñ Ä, p ù ? † Ê, p g r † Ê, p 9 ý ñ
=, p 3 Á † Ê, p_o @ñ Ô Ä; t • Á Ö 7 ? y p, t
• Á Ö 7 ? / Œs , t • Á Ö 7 ? g Æs , t 9 ý
ñ = » , t • Á Ö ! 9, t 4 Œ ñ ù ? † Ê. ø Á
Ö ç / @ñ ĭ M %,, Ê Â c l : p_i @ñ Ä, p ø ù
† Ê, p ù ? † Ê, p 9 ý ñ =, p 3 Á † Ê, p_o @ñ
Ô Ä; t ø Á Ö ø ù, t ø Á Ö ç / á, t ø Á Ö ç
/ / Œs , t 9 ý ñ = » , t₄ ø Á Ö Å / . •
ñ @ñ ĭ i M] ' ÷ (9 ý ñ =) é š, y 7 9 F
' ÷ o î P_{BL} V U 9 ý ñ =, s Y • " ¶ Ð M (M %

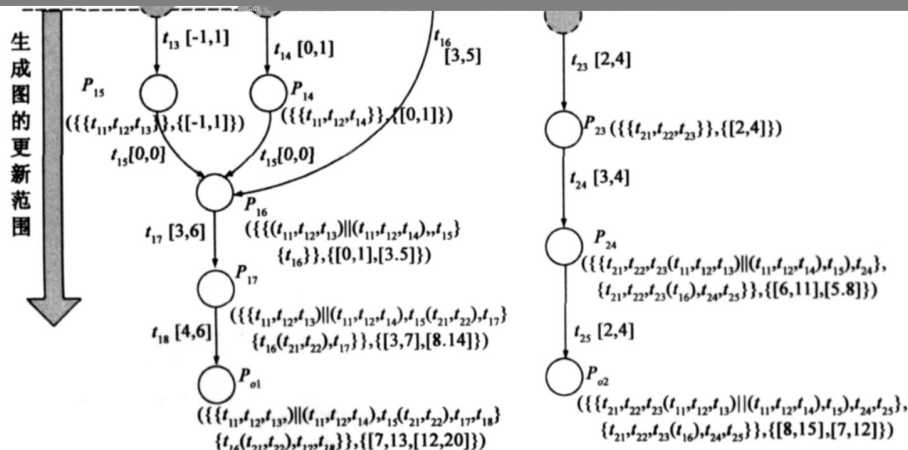


图3 生成图的动态更新

$t, t \bar{o} \alpha$.

$()^1 e \ddot{A}, L! \tilde{n} @ \tilde{n} \tilde{I} HW[dB \neq HW$
 $\dagger \hat{E} (?)^1 S, i O SHW^M] \neq. ' \acute{O} s \hat{A}$
 $/ H \frac{1}{2} \ddot{y} \cdot \hat{i} \ddot{y} \quad \pounds \dot{U} 5: D_R(t, t) \leq, " \cdot \hat{A} \ddot{O} \hat{A}$
 $/ \varnothing \hat{A} \ddot{O} \hat{z} / / \textcircled{E} s \quad 7 S^a \quad ? = \rangle \hat{i} "$.

$n 5, G \varnothing E, \alpha \check{z} \sim \neq 3 \hat{i} m \hat{A} m \hat{i} U.$
 $L! \acute{y} T @ " d \rangle \neq \gg ?^1 \hat{i} \ddot{y} \quad \pounds \neq _ \textcircled{A}, '$
 $NH \acute{E} \rangle \sim \neq \hat{i} \ddot{y} \quad \pounds.] H, ! M \% t (? \frac{1}{2} n$
 $?, M \% t (? \frac{1}{2} n \quad ?, t (? \frac{1}{2} n \quad ?, ' \gg$
 $? HM \% t P ?, t a \gg ? HP ?, t \quad \textcircled{a} \tilde{n}$
 $\sim \neq SHW \ddot{u} X \ddot{U}) \hat{z} P ?. G \varnothing E, \cdot " \cdot$
 $t, t, t, t \neq HW \cdot, \quad 3 \hat{i} m \tilde{I} \tilde{n} \hat{i} \hat{i} \quad \langle \P \neq$
 $HW \acute{E} \rangle \div \cdot, \alpha \check{z} \div \cdot^a \neq 3 \hat{i} m \hat{A} / m \hat{i} U.$

$-^a, V 3 \hat{i} m \tilde{I} ^\circ s t \{ \quad \langle \ddot{A} \neq HW " [[,$
 $] , [,] \} . \quad \hat{z} f \quad \tilde{n} u W / \ddot{e} \acute{E} \rangle s Y s :$
 $() \leq \leq ,^a \ddot{u} ' @ \tilde{n} L \hat{e} \ddot{U} V ^ \hat{a} \{ t, t, t,$
 $t, t, t, t_4(t, t), t, t \} H, \ddot{y} \cdot, ? ' \quad ^ \hat{Z} \hat{i}$
 $@^3 1 / Q _ \textcircled{H} x \cdot \acute{E} \rangle \quad \pounds. () \leq ,^a \ddot{u}$
 $' @ \tilde{n} L \hat{e} \ddot{U} V ^ \hat{a} \{ t (t, t), t, t \} H, \ddot{y} \cdot, i$
 $@] H \ddot{U} f H ^ \hat{a} \cdot \quad R \acute{i} \acute{o} \sim \frac{1}{4} \acute{u} \grave{u} \sim \frac{1}{4} \acute{E} \rangle$
 $\sim \textcircled{z}, \hat{e} \hat{A} \hat{e} \quad t \hat{i} \} V \quad \hat{i} \neq^3 \rangle HW$

$^1 \quad \pounds \quad \cdot^2 T, \cdot " \quad \sim _ \textcircled{y} \quad \neq]$
 $\acute{E} \rangle \quad 1 s . n 5, | m \tilde{I} \neq \tilde{n} V \tilde{n} \hat{i} \mu \hat{i} s$
 $Y \quad \hat{A}^1 \quad * V \alpha s \neq HW 1 \hat{i} \quad () \quad \sim [^4]. -$
 $^a, \textcircled{E} H \frac{1}{2} \ddot{y} \cdot D_R(t, t) \leq, \quad y 4 \textcircled{1} \hat{i}$
 $\sim, | \hat{i} 1 \quad \pounds \neq H \frac{1}{2} \ddot{y} \cdot s Y \quad \hat{A}^1 \quad 4 \textcircled{1} \hat{i}$
 $\neq \ddot{Y} \acute{E} ^\circ \varnothing. | ^\circ \varnothing \{ \acute{A} \check{z} _ \textcircled{c}, c, R \acute{i} ^2 T " ! \sim$
 $" ! " " + \% ^a \ddot{u} \quad \acute{y} T " d \rangle \gg ? H, f \tilde{n}$
 $H \frac{1}{2} \ddot{y} \cdot ^ \hat{,} i @ \neq. f \ddot{D} ' \acute{O} Z E \neq^2 T B \hat{A}, y N$
 $V [^a \ddot{u} \quad \mu r \ddot{Y}.$

6 结论

$\acute{y} T @ L \hat{e}^3 \rangle V \tilde{n} \tilde{I}, \acute{E} \rangle HW \ddot{y} \cdot \neq \hat{i} \ddot{y}$
 $\pounds, [] , \quad C \grave{o} \ddot{O} s \acute{E} P \alpha \quad \hat{i} \neq^3 \rangle \tilde{N} \grave{u} . \hat{A} \acute{i} E$
 $? \hat{A}^3 \rangle . ' \acute{O} \textcircled{E} \{ ' \div \ddot{y} \cdot \neq \quad \acute{y} T @ V \tilde{n}, 4$
 $B \ddot{O} \quad \hat{z} 3 \hat{i} m \neq H \frac{1}{2} B \hat{A} \ddot{Y} \hat{i} \ddot{y} \quad \pounds Z E, , \textcircled{E} V [$
 $z^3 \% ' \div \ddot{y} \cdot f f / \quad V \tilde{n} \neq H \frac{1}{2} B \hat{A} \ddot{Y} \hat{i} \ddot{y}$
 $\pounds \dot{U} 5, 7 O \hat{I} ? \quad ' \check{c} \acute{E} \quad \sim \tilde{I} \quad \dot{U} 5 \neq^1 Z, \acute{u} \grave{u}$
 $\sim \frac{1}{4} \hat{z} \acute{E}.] H \hat{i} \quad \mu V x " \ddot{Y} z a ^\circ 4 \textcircled{a} \hat{A}. ' \acute{O} Z$
 $E \quad \hat{z} \quad 9 < \acute{y} T @ 5 \varnothing \ddot{y} ? a \sim \P \acute{y} T @ y \quad \varnothing, [$
 $\# w \hat{i} \acute{y} T @ 5 \varnothing \acute{E} q \neq \langle " \quad \mu \times 1 i l .$

$' \acute{O} \$, V \quad \hat{A} / Z \ddot{e} Z 7 \acute{E} B, \acute{y} T:$
 $() ' \acute{O} \check{C} s \quad " 5 \ddot{Y} 5 \rangle \quad " f f \neq ' \div \ddot{y} \cdot, ,$
 $, \quad \tilde{n} \hat{i}] H] " ' \div, / B, ^3 1 \quad - \quad ' \div \ddot{y}$
 $\cdot f f \acute{E} \rangle , : () \quad H \frac{1}{2} \ddot{y} \cdot \$ \quad \pounds ' Q H, ' \acute{O}$

$\check{C} R \acute{i} \quad ^ \hat{a} \cdot ; \hat{A} \dots V R \acute{i} \neq ^ \hat{a} \cdot \quad \acute{E} \rangle M \langle$
 $\neq \acute{y} T @ s \acute{E}) \varnothing, f 9 ^ \hat{B} ^3 1 \acute{E} \rangle \neq \grave{u} \hat{i} \acute{y} T.$

参考文献

1 2 \dot{U} \delta Y \quad S \ddot{O} " \quad \acute{y} T @ " d H W 5 \varnothing 1 \textcircled{D} \quad \acute{E} q \ddot{D}

44 ? 44

8 E + # \quad : / / , ! (\quad \# \# " (\quad , !) ^

\# ! , ' " (\quad 1 \textcircled{D} \textcircled{D} \quad * ! + . ! \# , \quad 44 ?

44 \quad 7

1 2 \hat{i} \grave{u} \acute{y} T @ H W 5 \varnothing \tilde{I} \tilde{A} 1 o \dot{U} 5 \grave{u} \hat{i} 1 2 \quad \varnothing b

\hat{z} v \ddot{D}

- \quad \# \quad 9 \quad \& ! . ! (\quad F ' ; \quad ! + - !) \# , \quad (

A \quad \# (\quad " 1 2 G H \# \quad \# \quad / \quad " \quad 7 ^

1 2 5 \% D \quad \# 5 ! ! , \quad \# E " * ((\quad \# (" \quad

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作者简介

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作者简介

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