Жеребцов К. А. ИВТб-21 ДЗ №3

Минимизация автоматов Мили и Мура.

1. Автомат Мили S = <X, P, Λ, φ, ψ, x0>, x0 = x1

Таблица переходов:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | x1 | x2 | x3 | x4 | x5 | x6 | x7 | x8 | x9 | x10 |
| p1 | x3 | x7 | x10 | x8 | x5 | x10 | x4 | x3 | x10 | x7 |
| p2 | x4 | x8 | x1 | x2 | x9 | x3 | x7 | x4 | x1 | x8 |

Таблица выходов:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | x1 | x2 | x3 | x4 | x5 | x6 | x7 | x8 | x9 | x10 |
| p1 | λ1 | λ1 | λ2 | λ2 | λ1 | λ2 | λ1 | λ1 | λ2 | λ1 |
| p2 | λ2 | λ2 | λ1 | λ1 | λ2 | λ1 | λ2 | λ2 | λ1 | λ2 |

π1 : {x1, x2, x5, x7, x8, x10} B1; {x3, x4, x6, x9} B2

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | x1 | x2 | x5 | x7 | x8 | x10 |  | x3 | x4 | x6 | x9 |
| p1 | B2 | B1 | B1 | B2 | B2 | B1 |  | B1 | B1 | B1 | B1 |
| p2 | B2 | B1 | B2 | B1 | B2 | B1 |  | B1 | B1 | B2 | B1 |

π2 : {x1, x8} C1; {x2, x10} C2; {x5} C3; {x7} C4; {x3, x4, x9} C5; {x6} C6;

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | x1 | x8 |  | x2 | x10 |  | x5 |  | x7 |  | x3 | x4 | x9 |  | x6 |
| p1 | C5 | C5 |  | C4 | C4 |  | C3 |  | C5 |  | C2 | C1 | C2 |  | C2 |
| p2 | C5 | C5 |  | C1 | C1 |  | C5 |  | C4 |  | C1 | C2 | C1 |  | C5 |

π3 : {x1, x8} D1; {x2, x10} D2; {x5} D3; {x7} D4; {x3, x9} D5; {x4} D6; {x6} D7

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | x1 | x8 |  | x2 | x10 |  | x5 |  | x7 |  | x3 | x9 |  | x4 |  | x6 |
| p1 | D5 | D5 |  | D4 | D4 |  | D3 |  | D6 |  | D2 | D2 |  | D1 |  | D2 |
| p2 | D6 | D6 |  | D1 | D1 |  | D5 |  | D4 |  | D1 | D1 |  | D2 |  | D5 |

π4 : {x1, x8} E1; {x2, x10} E2; {x5} E3; {x7} E4; {x3, x9} E5; {x4} E6; {x6} E7

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | x1 | x8 |  | x2 | x10 |  | x5 |  | x7 |  | x3 | x9 |  | x4 |  | x6 |
| p1 | E5 | E5 |  | E4 | E4 |  | E3 |  | E6 |  | E2 | E2 |  | E1 |  | E2 |
| p2 | E6 | E6 |  | E1 | E1 |  | E5 |  | E4 |  | E1 | E1 |  | E2 |  | E5 |

π4 = π3

X’ = <x1, x2, x3, x4, x5, x6, x7>

x0’ = x1

φ’:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | x1 | x2 | x3 | x4 | x5 | x6 | x7 |
| p1 | x3 | x7 | x2 | x1 | x5 | x2 | x4 |
| p2 | x4 | x1 | x1 | x2 | x3 | x3 | x7 |

ψ’:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | x1 | x2 | x3 | x4 | x5 | x6 | x7 |
| p1 | λ1 | λ1 | λ2 | λ2 | λ1 | λ2 | λ1 |
| p2 | λ2 | λ2 | λ1 | λ1 | λ2 | λ1 | λ2 |

S = <X’, P, Λ, φ’, ψ’, x0’>

1. Автомат Мура S = <X, P, Λ, φ, ψ, x0>, x0 = x1

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | λ1 | λ1 | λ2 | λ2 | λ2 | λ3 | λ2 | λ1 | λ3 | λ3 |
|  | x1 | x2 | x3 | x4 | x5 | x6 | x7 | x8 | x9 | x10 |
| p1 | x2 | x5 | x10 | x2 | x6 | x3 | x9 | x5 | x3 | x7 |
| p2 | x5 | x7 | x9 | x5 | x7 | x8 | x10 | x7 | x8 | x1 |

π0 : {x1, x2, x8} A1; {x3, x4, x5, x7} A2; {x6, x9, x10} A3;

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | λ1 | | |  | λ2 | | | |  | λ3 | | |
|  | x1 | x2 | x8 |  | x3 | x4 | x5 | x7 |  | x6 | x9 | x10 |
| p1 | A1 | A2 | A2 |  | A3 | A1 | A3 | A3 |  | A2 | A2 | A2 |
| p2 | A2 | A2 | A2 |  | A3 | A2 | A2 | A3 |  | A1 | A1 | A1 |

π1 : {x1} B1; {x2, x8} B2; {x3, x7} B3; {x4} B4; {x5} B5; {x6, x9, x10} B6;

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | λ1 | | | |  | λ2 | | | | | |  | λ3 | | |
|  | x1 |  | x2 | x8 |  | x3 | x7 |  | x4 |  | x5 |  | x6 | x9 | x10 |
| p1 | B2 |  | B5 | B5 |  | B6 | B6 |  | B2 |  | B6 |  | B3 | B3 | B3 |
| p2 | B5 |  | B3 | B3 |  | B6 | B6 |  | B5 |  | B3 |  | B2 | B2 | B1 |

π2 : {x1} C1; {x2, x8} C2; {x3, x7} C3; {x4} C4; {x5} C5; {x6, x9} C6; {x10} C7

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | λ1 | | | |  | λ2 | | | | | |  | λ3 | | | |
|  | x1 |  | x2 | x8 |  | x3 | x7 |  | x4 |  | x5 |  | x6 | x9 |  | x10 |
| p1 | C2 |  | C5 | C5 |  | C7 | C6 |  | C2 |  | C6 |  | C3 | C3 |  | C3 |
| p2 | C5 |  | C3 | C3 |  | C6 | C7 |  | C5 |  | C3 |  | C2 | C2 |  | C1 |

π3 : {x1} D1; {x2, x8} D2; {x3} D3; {x7} D4 {x4} D5; {x5} D6; {x6, x9} D7;

{x10} D8

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | λ1 | | | |  | λ2 | | | | | | |  | λ3 | | | |
|  | x1 |  | x2 | x8 |  | x3 |  | x7 |  | x4 |  | x5 |  | x6 | x9 |  | x10 |
| p1 | D2 |  | D6 | D6 |  | D8 |  | D7 |  | D2 |  | D7 |  | D3 | D3 |  | D4 |
| p2 | D6 |  | D4 | D4 |  | D7 |  | D8 |  | D6 |  | D4 |  | D2 | D2 |  | D1 |

π4 : {x1} E1; {x2, x8} E2; {x3} E3; {x7} E4 {x4} E5; {x5} E6; {x6, x9} E7;

{x10} E8

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | λ1 | | | |  | λ2 | | | | | | |  | λ3 | | | |
|  | x1 |  | x2 | x8 |  | x3 |  | x7 |  | x4 |  | x5 |  | x6 | x9 |  | x10 |
| p1 | E2 |  | E6 | E6 |  | E8 |  | E7 |  | E2 |  | E7 |  | E3 | E3 |  | E4 |
| p2 | E6 |  | E4 | E4 |  | E7 |  | E8 |  | E6 |  | E4 |  | E2 | E2 |  | E1 |

π4 = π3

X’ = <x1, x2, x3, x4, x5, x6, x7, x10>

x0’ = x1

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | λ1 | λ1 | λ2 | λ2 | λ2 | λ3 | λ2 | λ3 |
|  | x1 | x2 | x3 | x4 | x5 | x6 | x7 | x10 |
| p1 | x2 | x5 | x10 | x2 | x6 | x3 | x6 | x7 |
| p2 | x5 | x7 | x6 | x5 | x7 | x2 | x10 | x1 |

S = <X’, P, Λ, φ’, ψ’, x0’>