Adam Gincel

CS 135

Professor Engling

12 April 2015

*I pledge my Honor I’ve abided by the Stevens Honor System.*

Homework 7

1. .
   1. {(1, 0), (2, 1), (2, 0), (3, 2), (3, 1), (3, 0), (4, 3), (4, 2), (4, 1), (4, 0)}
2. .

A: {(1, 1), (1, 2), (1, 3), (1, 4), (1, 5), (1, 6), (2, 2), (2, 4), (2, 6), (3, 3), (3, 6), (4, 4), (5, 5), (6, 6)}

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| R | 1 | 2 | 3 | 4 | 5 | 6 |
| 1 | x | x | x | x | x | x |
| 2 |  | x |  | x |  | x |
| 3 |  |  | x |  |  | x |
| 4 |  |  |  | x |  |  |
| 5 |  |  |  |  | x |  |
| 6 |  |  |  |  |  | x |

B:

1. .

A: Transitive

B: Reflexive, Transitive, Symmetric

C: Symmetric

D: Antisymmetric

E: Reflexive, Symmetric

1. .

A: Antisymmetric, Transitive

B: Reflexive, Transitive, Symmetric

C: Reflexive, Transitive, Symmetric

D: Reflexive, Symmetric

1. .

A: {(1, 1), (1, 2), (2, 1), (2, 2), (2, 3), (3, 1), (3, 2), (3, 3), (3, 4)}

B: {(1, 2), (2, 3), (3, 4)}

C: {()}

D: {(1, 1), (2, 1), (2, 2), (3, 1), (3, 2), (3, 3)}

|  |  |  |  |
| --- | --- | --- | --- |
| 0 | 1 | 1 | 1 |
| 1 | 0 | 1 | 1 |
| 1 | 1 | 0 | 1 |
| 1 | 1 | 1 | 0 |

9.3

2.

C: [ ]

4.

A: {(1, 1), (1, 2), (1, 4), (2, 1), (2, 3), (3, 2), (3, 3), (3, 4), (4, 1), (4, 3), (4, 4)}

|  |  |  |
| --- | --- | --- |
| 0 | 0 | 1 |
| 1 | 1 | 0 |
| 0 | 1 | 1 |

15.

A:

|  |  |  |
| --- | --- | --- |
| 1 | 1 | 0 |
| 0 | 1 | 1 |
| 1 | 1 | 1 |

B:

24. {(a, a), (a, c), (b, a), (b, b), (b, c), (c, c)}

9.4

1:

A: Reflexive Closure: {(0, 0), (3, 3)}

B: Symmetric Closure: {(1, 0), (2, 1), (0, 2), (0, 3)}

26.

A:

(a, c) (c, a) -> (a, a), (c, c)

(b, d) (d, b) -> (b, b), (d, d)

(e, d) (d, b) -> (e, b)

Transitive Closure: {(a, a), (b, b), (c, c), (d, d), (e, b)}

B:

(b, c) (c, e) -> (b, e)

(b, e) (e, b) -> (b, b), (e, e)

(c, e), (e, c) -> (c, c), (e, e)

(e, b) (b, c) -> (e, c)

Transitive Closure: {(b, e), (b, b), (e, e), (c, c), (e, c)}