

Using python3.10 (3.10.7)

Problem 1

A: {'c', 'a', 'd', 'b'}

B: {'z', 'y', 'x', 'v', 'w'}

R: {('c', 'x'), ('a', 'z'), ('d', 'w'), ('b', 'y')}

R is a total function

Injective?: True

Surjective?: False

Bijjective?: False

Problem 2

A: {'c', 'a', 'd', 'b'}

B: {'z', 'y', 'x'}

R: {('c', 'x'), ('d', 'z'), ('a', 'z'), ('b', 'y')}

R is a total function

Injective?: False

Surjective?: True

Bijjective?: False

Problem 3

A: {'c', 'a', 'd', 'b'}

B: {'z', 'w', 'y', 'x'}

R: {('c', 'x'), ('a', 'z'), ('d', 'w'), ('b', 'y')}

R is a total function

Injective?: True

Surjective?: True

Bijjective?: True

Inverse: {('y', 'b'), ('w', 'd'), ('z', 'a'), ('x', 'c')}

Problem 4

A: {'c', 'a', 'd', 'b'}

B: {1, 2, 3, 4, 5}

R: {('c', 1), ('b', 5), ('d', 3), ('a', 4)}

R is a total function

Injective?: True

Surjective?: False

Bijjective?: False

Problem 5

A: {'c', 'a', 'b'}

B: {1, 2, 3, 4}

R: {('b', 4), ('a', 3), ('c', 1)}

R is a total function

Injective?: True

Surjective?: False

Bijjective?: False

Problem 6

A: {'c', 'a', 'd', 'b'}

B: {1, 2, 3}

R: {('b', 1), ('c', 3), ('d', 2), ('a', 2)}

R is a total function

Injective?: False

Surjective?: True

Bijjective?: False

Problem 7

A: {'c', 'a', 'd', 'b'}

B: {1, 2, 3, 4}

R: {('c', 3), ('d', 2), ('b', 1), ('a', 4)}

R is a total function

Injective?: True

Surjective?: True

Bijective?: True

Inverse: {(1, 'b'), (4, 'a'), (3, 'c'), (2, 'd')}

Problem 8

A: {'c', 'a', 'd', 'b'}

B: {1, 2, 3, 4}

R: {('d', 3), ('b', 1), ('c', 2), ('a', 2)}

R is a total function

Injective?: False

Surjective?: False

Bijective?: False

Problem 9

A: {'c', 'a', 'b'}

B: {1, 2, 3, 4}

R: {('b', 1), ('c', 3), ('a', 2), ('a', 4)}

R is not a total function

