SYSC 4101A
Lab 8
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Exercise 1
Question 1

P = A or (B and not(C))

Major clause A: A determines P.
- **A=true,** B=false, C=false, P=true
- **A=false,** B=false, C=false, P=false

Major clause B: C must be false to determine P.
- A=true, **B=true**, C=false, P=true
- A=true, **B=false**, C=false, P=false

Major clause C: B must be true to determine P.
- A=true, B=true, **C=true**, P=false
- A=true, B=true, **C=false**, P=true

Test suite:

(true, false, false), (false, false, false), (true, true, false), (true, true, true)
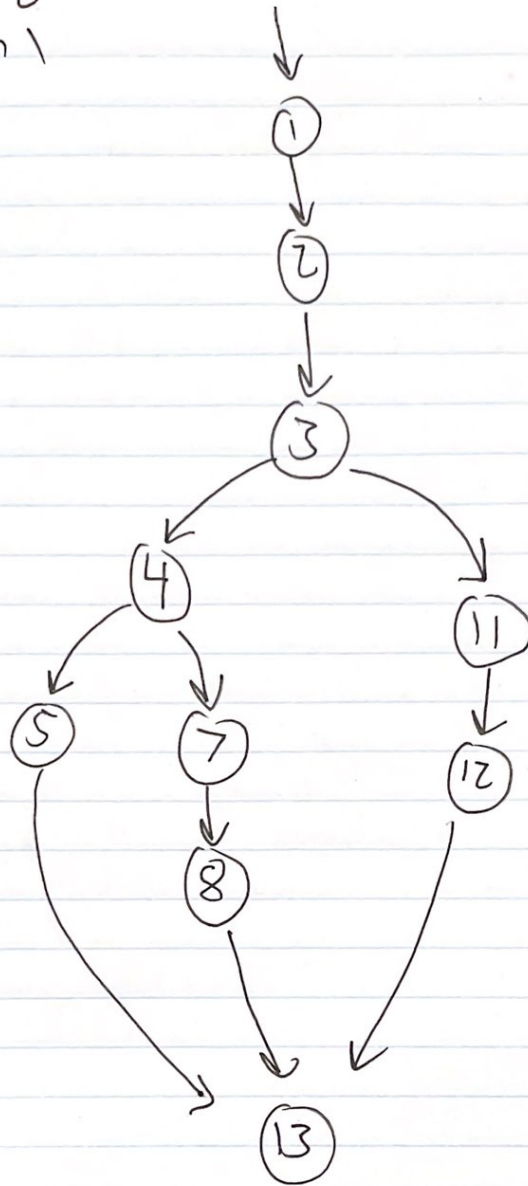
Question 2

P = A or (B and not(C))

- UTP for A: (1, ?, ?) -> (1, 0, 0), (1, 1, 0), (1, 0, 1), (1, 1, 1)
- NFP for A: (0, ?, ?) -> (0, 0, 0), (0, 1, 0), (0, 0, 1), (0, 1, 1)
- UTP for Bnot(C): (?, 1, 1) -> (0, 1, 1), (1, 1, 1)
- NFP for B in Bnot(C): (?, 0, 1) -> (0, 0, 1), (1, 0, 1)
- NFP for C in Bnot(C): (? 1, 0) -> (0, 1, 0), (1, 1, 0)

Test suite:

(1, 0, 0), (1, 1, 0), (1, 0, 1), (1, 1, 1), (0, 0, 0), (0, 1, 0), (0, 0, 1), (0, 1, 1)

Question

Exercise 2
Question 1

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Question 2

TC1 Path = (1, 2, 3, 4, 5, 13)
TC2 Path = (1, 2, 3, 4, 7, 8, 13)
TC3 Path = (1, 2, 3, 11, 12, 13)

Based on my CFG, yes it satisfies the All-Edge criterion.

Question 3

P1 = A and B

Major clause A: B must be true for A to determine P.
- **A=true**, B=true, P=true
- **A=false**, B=true, P=false

Major clause B: A must be true for B to determine P.
- A=true, **B=true**, P=true
- A=true, **B=false**, P=false

Test suite:

(true, true), (false, true), (true, false)

P2 = C or B

Major clause C: C can determine the P.
- **C=true**, B=false, P=true
- **C=false**, B=false, P=false

Major clause B: B can determine the P.
- C=true, **B=true**, P=true
- C=false, **B=false**, P=false

Test suite:

(true, true), (false, true), (false, false)

Question 4

P1 = A and B

For this predicate, the test suite {TC1, TC2, TC3} is not adequate. The test requirement (false, true) is not met. To make it adequate, another test case must be made. It must be TC4: (a=6, b=46, c=0). This also ensures that it still satisfies All-Edge criterion.

P2 = C or B

For this predicate, the test suite {TC1, TC2, TC3} is not adequate. The test requirement (false, true) is not met. To make it adequate, another test case must be made. It must be TC4: (a=14, b=14, c=0). This also ensures that it still satisfies All-Edge criterion.

Question 5

P1 = A and B

- UTP for A: (1, ?) -> (1, 0), (1, 1)
- NFP for A: (0, ?) -> (0, 0), (0, 1)
- UTP for B: (?, 1) -> (0, 1), (1, 1)
- NFP for B: (?, 0) -> (0, 0), (1, 0)

Test suite:

(0, 0), (1, 1), (1, 0), (0, 1)

P2 = C or B

- UTP for C: (1, ?) -> (1, 0), (1, 1)
- NFP for C: (0, ?) -> (0, 0), (0, 1)
- UTP for B: (?, 1) -> (0, 1), (1, 1)
- NFP for B: (?, 0) -> (0, 0), (1, 0)

Test suite:

(0, 0), (1, 1), (1, 0), (0, 1)

Exercise 3
Question A

Major clause A: B must be true for A to determine P.
- **A=true,** B=true, C=true, P=true
- **A=false,** B=true, C=true, P=false

Major clause B: Either A must be true or C must be false for B to determine P.
- A=true, **B=true**, C=true, P=true
- A=true, **B=false**, C=true, P=false
- A=false, **B=true**, C=false, P=true
- A=false, **B=false**, C=false, P=false

Major clause C: Either B must be true or C determines P.
- A=true, B=true, **C=true**, P=false
- A=true, B=true, **C=false**, P=true
- A=true, B=false, **C=true**, P=false

- A=true, B=false, **C=false**, P=true

Test suite:

(true, true, true), (false, true, true), (true, false, true), (false, true, false), (false, false, false), (true false, false)

Question B

- UTP for AandB: (1, 1, ?) -> (1, 1, 0), (1, 1, 1)
- NFP for A in AandB: (0, 1, ?) -> (0, 1, 0), (0, 1, 1)
- NFP for B in AandB: (1, 0, ?) -> (1, 0, 0), (1, 0, 1)
- UTP for BandnotC: (1, 1, ?) -> (1, 1, 0), (1, 1, 1)
- NFP for B in BandnotC: (0, 1, ?) -> (0, 1, 0), (0, 1, 1)
- NFP for C in BandnotC: (1, 0, ?) -> (1, 0, 0), (1, 0, 1)
- UTP for notC: (?, ?, 1) -> (0, 0, 1), (1, 0, 1), (1, 1, 1), (0, 1, 1)
- NFP for notC: (?, ?, 0) -> (0, 0, 0), (1, 0, 0), (0, 1, 0), (1, 1, 0)

Test suite:

(0, 0, 0), (1, 1, 1), (1, 0, 0), (0, 0, 1), (1, 0, 1), (0, 1, 0), (0, 1, 1), (0, 1, 1)

Exercise 4
Question A

Major clause A: B must be false for A to determine P.
- **A=true,** B=false, C=true, P=true
- **A=false,** B=false, C=true, P=false

Major clause B: A must be true for B to determine P.
- A=true, **B=true**, C=true, P=true
- A=true, **B=false**, C=true, P=false

Major clause C: C determines P.
- A=true, B=true, **C=true**, P=false
- A=true, B=true, **C=false**, P=true

Test suite:

(true, false, true), (false, false, true), (true, true, true), (true, true, false)

Question B

- UTP for AandnotB: (1, 1, ?) -> (1, 1, 0), (1, 1, 1)
- NFP for A in AandnotB: (0, 1, ?) -> (0, 1, 0), (0, 1, 1)
- NFP for B in AandnotB: (1, 0, ?) -> (1, 0, 0), (1, 0, 1)

- UTP for notC: (?, ?, 1) -> (0, 0, 1), (1, 0, 1), (1, 1, 1), (0, 1, 1)
- NFP for notC: (?, ?, 0) -> (0, 0, 0), (1, 0, 0), (0, 1, 0), (1, 1, 0)

Test suite:

(0, 0, 0), (1, 1, 1), (1, 0, 0), (0, 0, 1), (1, 0, 1), (0, 1, 0), (0, 1, 1), (0, 1, 1)

Question C

None from Question A become infeasible.
(1, 0, 0)/(true, false, false) from Question B is the only one that is infeasible.

Exercise 5

- UTP for AandnotB: (1, 1, ?, ?) -> (1, 1, 0, 0), (1, 1, 1, 0), (1, 1, 0, 1), (1, 1, 1, 1)
- NFP for A in AandnotB: (0, 1, ?, ?) -> (0, 1, 0, 0), (0, 1, 1, 0), (0, 1, 0, 1), (0, 1, 1, 1)
- NFP for B in AandnotB: (1, 0, ?, ?) -> (1, 0, 0, 0), (1, 0, 1, 0), (1, 0, 0, 1), (1, 0, 1, 1)
- UTP for notAandD: (1, ?, ?, 1) -> (1, 0, 0, 1), (1, 1, 0, 1), (1, 1, 1, 1), (1, 0, 1, 1)
- NFP for A in notAandD: (0, ?, ?, 1) -> (0, 0, 0, 1), (0, 1, 0, 1), (0, 0, 1, 1), (0, 1, 1, 1)
- NFP for D in notAandD: (1, ?, ?, 0) -> (1, 0, 0, 0), (1, 1, 0, 0), (1, 0, 1, 0), (1, 1, 1, 0)
- UTP for notCandnotD: (?, ?, 1, 1) -> (0, 0, 1, 1), (1, 0, 1, 1), (0, 1, 1, 1), (1, 1, 1, 1)
- NFP for C in notCandnotD: (?, ?, 0, 1) -> (0, 0, 0, 1), (0, 1, 0, 1), (1, 0, 0, 1), (1, 1, 0, 1)
- NFP for D in notCandnotD: (?, ?, 1, 0) -> (0, 0, 1, 0), (1, 1, 1, 0), (1, 0, 1, 0), (0, 1, 1, 0)

Test suite:

(0, 0, 0), (1, 1, 1), (1, 0, 0), (0, 0, 1), (1, 0, 1), (0, 1, 0), (0, 1, 1), (0, 1, 1)