**SYSC 4101: Lab 8**

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**Exercise 1**

1. A or (B and not (C))

|  |  |  |  |
| --- | --- | --- | --- |
|  | **ABC** | **Result** | **Corr. False Case** |
| **1** | TTT | T | A(5) |
| **2** | TTF | T |  |
| **3** | TFT | T | A(7) |
| **4** | TFF | T | A(8) |
| **5** | FTT | F | A(1), C(6) |
| **6** | FTF | T | B(8), C(5) |
| **7** | FFT | F | A(3) |
| **8** | FFF | F | A(4), B(6) |

Taking a Pair from each:

A: (1, 5) or (3, 7) or (4, 8)

B: (6, 8)

C: (5, 6)

Test Case:

(1, 5, 6, 8)

1. Unique true points for P:

UTP for A: (T, ?, ?) -> (T, T, T) or (T, F, T) or (T, F, F)

UTP for B and not (C): (?, T, F) -> (F, T, F)

Near False Points for P:

NFP for A: (F, ?, ?) -> (F, F, T) or (F, T, T) or (F, F, F)

NFP for B in (B and not (C)): (?, F, ?) -> (F, F, F)

NFP for C in (B and not (C)): (?, ? , F) -> (F, T, F)

**Exercise 2**

1. Control Flow Graph:

A graph paper with numbers and arrows

Description automatically generated

1. Yes these three test suites are all-edges adequate.

TC1 follows edges: E1, E2, E3, E4

TC2 follows edges: E1, E2, E6, E7

TC3 follows edges: E1, E5, E8

A graph paper with numbers and numbers

Description automatically generated

1. First predicate: (a > 12 and b < 45):

|  |  |  |  |
| --- | --- | --- | --- |
|  | **(a>12), (b<45)** | **Result** | **Corr. False Case** |
| **1** | TT | T | a>12(3), b<45(2) |
| **2** | TF | F | b<45(1) |
| **3** | FT | F | a>12(1) |
| **4** | FF | F |  |

Taking a pair from each:

(a>12): (1, 3)

(b<45): (1, 2)

Test Cases: (1, 2, 3) = a>12 and b<45, a>12 and b >=45, a<=12 and b<45

Second predicate: (c > 4 or b > 0):

|  |  |  |  |
| --- | --- | --- | --- |
|  | **(c>4), (b>0)** | **Result** | **Corr. False Case** |
| **1** | TT | T |  |
| **2** | TF | T | c>4(4) |
| **3** | FT | T | b>0(4) |
| **4** | FF | F | c>4(2), b>0(3) |

Taking a pair from each:

(c>4): (2, 4)

(b>0): (3, 4)

Test Cases: (2, 3, 4)

1. Unique true points for (a > 12 and b < 45):

UTP for a>12 : (T, ?) -> (T, F) – a could be 15 and b could be 50

UTP for b<45: (?, T) -> (F, T) – a could be 5 and b could be 20

Near False Points:

NFP for a>12 in (a > 12 and b < 45): -> (F, T) – a could be 13 and b could be 40

NFP for b<45 in (a > 12 and b < 45): -> (T, F) – a coule be 15 and b could be 50

**Exercise 3**

1. RACC:

|  |  |  |  |
| --- | --- | --- | --- |
|  | **ABC** | **Result** | **Corr. False Case** |
| **1** | TTT | T | A(5), B(3) |
| **2** | TTF | T |  |
| **3** | TFT | F | A(7), B(1), C(4) |
| **4** | TFF | T | C(3) |
| **5** | FTT | F | A(1), B(7), C(6) |
| **6** | FTF | T | C(5) |
| **7** | FFT | T | A(3), B(5) |
| **8** | FFF | T |  |

b) Taking a pair from each:

A: (1, 5) or (1, 3)

B: (1, 3) or (5, 7)

C: (3, 4) or (4, 6)

One possible test case:

(1, 3, 4)

1. Unique true Points:

UTP for ab: (T, T, ?) -> (T, T, T)

UTP for b and not(c): (?, T, F) -> (F, T, F)

UTP for not(c): (?, ?, F) -> (F, F, F) or (T, F, F)

Near False Points:

NFP for a in ab: (F, ?, ?) -> (F, F, F) or (F, T, T)

NFP for b in ab: (?, F, ?) -> (T, F, T)

NFP for b in bc: (?, F, ?) -> (T, F, T)

NFP for c in bc: (?, ?, F) -> ()

NFP for c in c:

Exercise 4

1. RACC:

|  |  |  |  |
| --- | --- | --- | --- |
|  | **ABC** | **Result** | **Corr. False Case** |
| **1** | TTT | F | B(3), C(2) |
| **2** | TTF | T | C(1) |
| **3** | TFT | T | A(7), B(1) |
| **4** | TFF | T |  |
| **5** | FTT | F | C(6) |
| **6** | FTF | T | C(5) |
| **7** | FFT | F | A(3), C(8) |
| **8** | FFF | T | C(7) |

Taking a pair from each clause:

A: (3, 7)

B: (1, 3)

C: (1, 2) or (5, 6) or (7, 8)

One possible test case:

(1, 2, 3, 7)

1. Unique true Points:

UTP for a and not(b): (T, F, ?) -> (T, F, T)

UTP for not(c): (?, ?, F) -> (F, F, F) or (F, T, F) or (T, T, F)

Near False Points:

NFP for a in a and not(b): (F, ?, ?) -> (F, F, F) or (F, T, T)

NFP for b in a and not(b): (?, F, ?) -> (T, F, F)

NFP for c in not(c): (?, ?, T) -> (T,F,T) or (F,F,T)