In-Class Exercises Week 10

Software Testing & Maintenance

SWE 437/637

go.gmu.edu/SoftwareTestingFall24

Dr. Brittany Johnson-Matthews

(Dr. B for short)

Exercise #1

Given predicate $p = a \wedge (\neg b \vee c)$

- Compute the conditions under which ***a*** determines ***p***
- Compute the conditions under which ***b*** determines ***p***
- Compute the conditions under which ***c*** determines ***p***
- Write the truth table for each clause, including which clause determines the predicate
  - Identify GACC rows for ***a***, ***b***, and ***c***
  - Identify CACC rows for ***a***, ***b***, and ***c***
  - Identify RACC rows for ***a***, ***b***, and ***c***

Exercise #1 – a determines p

Given predicate $p = a \wedge (\neg b \vee c)$

Compute the conditions under which ***a*** determines ***p***

Exercise #1 – b determines p

Given predicate $p = a \wedge (\neg b \vee c)$

Compute the conditions under which b determines p

Exercise #1 – c determines p

Given predicate $p = a \wedge (\neg b \vee c)$

Compute the conditions under which c determines p

Exercise #1 – determining clauses

Write the truth table for each clause, including which clause determines the predicate

	a	b	c	$a \wedge (\neg b \vee c)$	p_a	p_b	p_c
1							
2							
3							
4							
5							
6							
7							
8							

Exercise #1 – GACC

General Active Clause Coverage (GACC) – For each ***p*** in ***P*** and each major clause c_i in ***Cp***, choose minor clauses c_j ($j \neq i$) such that ***ci*** determines ***p***. ***TR*** has two requirements for c_i: c_i evaluates to true and ***ci*** evaluates to false. The values chosen for minor clauses c_j do not need to be the same when ***ci*** is true as when c_i is false.

	a	b	c	$a \wedge (\neg b \vee c)$	p_a	p_b	p_c
1							
2							
3							
4							
5							
6							
7							
8							

List all rows that satisfy GACC with respect to ***a***:

List all rows that satisfy GACC with respect to *b*:

List all rows that satisfy GACC with respect to *c*:

Exercise #1 – CACC

Correlated Active Clause Coverage (CACC) – For each ***p*** in ***P*** and each major clause c_i in $C_{p'}$ choose minor clauses c_j ($j \neq i$) such that ***ci*** determines ***p***. ***TR*** has two requirements for c_i: c_i evaluates to true and ***ci*** evaluates to false. The values chosen for minor clauses c_j must cause **p** to be true for one value of major clause c_i and false for the other value of c_i.

	a	b	c	$a \wedge (\neg b \vee c)$	p_a	p_b	p_c
1							
2							
3							
4							
5							
6							
7							
8							

List all rows that satisfy CACC with respect to ***a***:

List all rows that satisfy CACC with respect to *b*:

List all rows that satisfy CACC with respect to *c*:

Exercise #1 – RACC

Restricted Active Clause Coverage (RACC) – For each ***p*** in ***P*** and each major clause c_i in C_p, choose minor clauses c_j ($j \neq i$) such that ***ci*** determines ***p***. ***TR*** has two requirements for c_i: c_i evaluates to true and ***ci*** evaluates to false. The values chosen for minor clauses c_j must be the same when c_i is true as when c_i is false.

	a	b	c	$a \wedge (\neg b \vee c)$	p_a	p_b	p_c
1							
2							
3							
4							
5							
6							
7							
8							

List all rows that satisfy RACC with respect to ***a***:

List all rows that satisfy RACC with respect to *b*:

List all rows that satisfy RACC with respect to *c*:

END OF EXERCISE 1

Exercise #2

Given predicate $p = a \vee (b \wedge c)$

- Compute the conditions under which ***a*** determines ***p***
- Compute the conditions under which ***b*** determines ***p***
- Compute the conditions under which ***c*** determines ***p***
- Write the truth table for each clause, including which clause determines the predicate
  - Identify GACC rows for ***a***, ***b***, and ***c***
  - Identify CACC rows for ***a***, ***b***, and ***c***
  - Identify RACC rows for ***a***, ***b***, and ***c***
  - Identify 4-tuples of rows for GICC for ***a***, ***b***, and ***c***
  - Identify 4-tuples of rows for RICC for ***a***, ***b***, and ***c***

Exercise #2 – a determines p

Given predicate $p = a \vee (b \wedge c)$

Compute the conditions under which ***a*** determines ***p***

Exercise #2 – b determines p

Given predicate $p = a \vee (b \wedge c)$

Compute the conditions under which b determines p

Exercise #2 – c determines p

Given predicate $p = a \vee (b \wedge c)$

Compute the conditions under which c determines p

Exercise #2 – determining clauses

Write the truth table for each clause, including which clause determines the predicate

	a	b	c	$a \vee (b \wedge c)$	p_a	p_b	p_c
1							
2							
3							
4							
5							
6							
7							
8							

Exercise #1 – GACC

General Active Clause Coverage (GACC) – For each ***p*** in ***P*** and each major clause c_i in ***Cp***, choose minor clauses c_j ($j \neq i$) such that ***ci*** determines ***p***. ***TR*** has two requirements for c_i: c_i evaluates to true and ***ci*** evaluates to false. The values chosen for minor clauses c_j do not need to be the same when ***ci*** is true as when c_i is false.

	a	b	c	$a \vee (b \wedge c)$	p_a	p_b	p_c
1							
2							
3							
4							
5							
6							
7							
8							

List all rows that satisfy GACC with respect to ***a***:

List all rows that satisfy GACC with respect to *b*:

List all rows that satisfy GACC with respect to *c*:

Exercise #1 – CACC

Correlated Active Clause Coverage (CACC) – For each ***p*** in ***P*** and each major clause c_i in $C_{p'}$ choose minor clauses c_j ($j \neq i$) such that ***ci*** determines ***p***. ***TR*** has two requirements for c_i: c_i evaluates to true and ***ci*** evaluates to false. The values chosen for minor clauses c_j must cause **p** to be true for one value of major clause c_i and false for the other value of c_i.

	a	b	c	$a \vee (b \wedge c)$	p_a	p_b	p_c
1							
2							
3							
4							
5							
6							
7							
8							

List all rows that satisfy CACC with respect to ***a***:

List all rows that satisfy CACC with respect to *b*:

List all rows that satisfy CACC with respect to *c*:

Exercise #1 – RACC

Restricted Active Clause Coverage (RACC) – For each ***p*** in ***P*** and each major clause c_i in C_p, choose minor clauses c_j ($j \neq i$) such that ***ci*** determines ***p***. ***TR*** has two requirements for c_i: c_i evaluates to true and ***ci*** evaluates to false. The values chosen for minor clauses c_j must be the same when c_i is true as when c_i is false.

	a	b	c	$a \wedge (\neg b \vee c)$	p_a	p_b	p_c
1							
2							
3							
4							
5							
6							
7							
8							

List all rows that satisfy RACC with respect to ***a***:

List all rows that satisfy RACC with respect to *b*:

List all rows that satisfy RACC with respect to *c*:

END OF EXERCISE 2