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CS 4750 HW #5

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1.) 1. Zero, there is a cycle in D->C and D->F and C->F, so none of the arcs can be consistent, and the variable color set with only two options cannot be solved.

2. Multiple,

3. AC-3 Before:

C – {r}
A – { r, b, g }
B – { r, b, g }
D – {r, g }
E – { r, b , g }
F – { r, b, g }'

AC – 3 After:

C – {r}
A – { b, g }
B – { r, b }
D – { g }
E – { r, g }
F – { b }

4. Backtracking search w/forward checking

C – {r]	- {r}	- { r }	- {r}	- {r}	- {r}	- {r}
A – {r, g, b }	- {g ,b}	- {g}	- {g}	- {g}	- {g}	- {g}
B – {r, g, b }	- {r, g, b}	- {r, b}	- {r}	- {r}	- {r}	- {r}
D – {r, g, b }	- {g, b}	- {g, b}	- {g, b}	- {g}	- {g}	- {g}
E – {r, g, b }	- {r, g, b}	- {r, g, b}	- {r, g, b}	- {r, g, b}	- {r, g}	– {r}
F – {r, g, b }	- {g, b}	- {g, b}	- {g, b}	- {b}	- {b}	- {b}

2.) 1.) Variables -> T, W, O, F, U, R

Domains -> alldifferent(T,W,O,F,U,R)

All variables are in range (0..9)

Constraints: (X.i is a carryout)

R= O+O + 10 * X.1

X.1 + U=W+W + 10 * X.2

X.2 + O=T+T +10 * X.3

X.3 = F

2) On attached paper

3.) On attached paper

4.) On attached paper

5.) On attached paper