CS3600 – Homework 2.5 – Constraint Satisfaction Problems (*solution*)

This is a sample solution for this problem. Many possible solutions and steps are possible.

1. Choose the X_3 variable. Its domain is {0, 1}.
2. Choose the value 1 for X_3. (We can't chose 0, it wouldn't survive forward checking, because it would force F to be 0, and leading digits must be non-zero).
3. Choose F, because it only has one remaining value.
4. Choose the value 1 for F.
5. Now X_2 and X_1 are tied for minimum remaining values at 2; arbitrarily choose X_2.
6. Either value survives forward checking, so arbitrarily choose 0 for X_2.
7. Now X_1 has the minimum remaining values.
8. Again, arbitrarily choose 0 for the value of X_1.
9. The variable O must be an even number (because it is the sum of T + T less than 5 (because O + O = R + 10 O). That makes it most constrained).
10. Arbitrarily choose 4 as the value of O.
11. R now only has 1 remaining value.
12. Choose the value of 8 for R.
13. T now only has 1 remaining value.
14. Choose the value 7 for T.
15. U must be an even number less than 9; choose U.
16. The only value for U that survives forward checking is 6.
17. The only variable left is W.
18. The only value left for W is 3.
19. We have arrived at a solution.