Name: _____ CS3733 Final Exam

1. **[4 pt]** Which form of coupling is better and why? **Common Coupling** or **Data Coupling**?

2. **[12 pt]** An infinite loop occurs when a computer program enters a loop and cannot exit; when this happens, the user must terminate the program.
   (a) Can you use Black Box Testing to detect an infinite loop in a program? Why?

   (b) Can you use White Box Testing to detect an infinite loop in a program? Why?

3. **[8 pt]** Maintenance and Development are both affected by reuse. Which shows the greater improvement as the percentage of reuse increases and why?

4. **[12 pt]** What are three common forms of maintenance?

   (a)
   (b)
   (c)

5. **[12 pt]** How is maintenance different in the following life cycle models?

   (a) Waterfall

   (b) Recursive/Parallel

6. [**12 pt**] What form of coupling exists in this pseudo-code example and how would you fix it?

Display
MainLoop()

MiniCalc
Compute (int a, int b, char op)

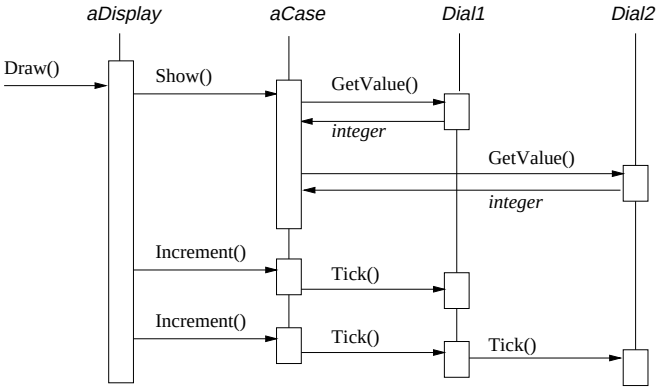
```
// Users enter two integers, x and y, and an operation
// ("+", "-", "*", "/").  It calculates the expression
// "x op y".  For example, "2", "3", "*" will print 6.
Display::MainLoop()
  {
    mc = new MiniCalc
    while (true)
      {
        print "Enter 2 numbers and an operation"
        x = read integer
        y = read integer
        op = read char     // one of "+", "-", "*", "/"
        value = mc->Compute (x, y, op)

        if (value == -97531)
          print "Division by zero."
        else if (value == -13579)
          print "Unknown operation."
        else
          print value
      }
  }
```

```
// Perform Calculation
MiniCalc::Compute(int a, int b, char op)
{
  switch (op)
    {
      case "+": return (a+b)
      case "-": return (a-b)
      case "*": return (a*b)
      case "/":
        if (b == 0)
          return (-97531)
        else
          return (a/b)
    }
  return (-13579)
}
```

7. [**0 pt**] Dilbert cartoon.

8. [**8 pt**] What is the difference between Bottom-Up testing and Top-Down testing?

9. [**20 pt**] Given the following object interaction diagram, fill in the CRC diagrams for the classes **Display**, **Case**, **Dial**.



10. [**12 pt**] Match concepts with definitions

    (1) The process of locating the exact cause of a fault and correcting it.

    (2) The degree of interaction within a module or object.

    (3) The process of detecting a fault but not the reason for the fault.

    (4) The degree of interaction between two modules or objects.

    (a) Coupling ____
    (b) Cohesion ____
    (c) Debugging ____
    (d) Testing ____