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?

```java
// 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.

![Object Interaction Diagram](image-url)

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