The University of Melbourne
CVEN30008 Engineering Risk Analysis

Hypothesis Testing Part 2

1. **Two methods are being considered for a paint manufacturing process, in order to increase production. In a random sample of 100 days, the mean daily production using the first method was 625 tons and the standard deviation was 40 tons. In a random sample of 64 days, the mean daily production using the second method was 640 tons and the standard deviation was 50 tons. Assume the samples are independent. Can you conclude that the second method yields a greater mean daily production? Use MATLAB to verify your results.**

2. **A crayon manufacturer is comparing the effects of two kinds of yellow dye on the brittleness of crayons. Dye B is more expensive that dye A, but it is thought that it might produce a stronger crayon. Three crayons are tested with dye A, while four crayons are tested with dye B. The results are as follows:**

   Dye A: 2.0 1.2 3.0

   Dye B: 3.0 3.2 2.6 3.4

   Can you conclude that the mean strength of crayons made with dye B is greater than that of crayons made with dye A based on a significant level of 0.05? Verify your results by using MATLAB.

3. **Two formulations of a certain coating, designed to inhibit corrosion, are being tested. For each of eight pipes, half the pipe is coated with formulation A and the other half is coated with formulation B. Each pipe is exposed to a salt environment for 500 hours. Afterward, the corrosion loss (in μm) is measured for each formulation on each pipe.**

   Formulation A: 197 161 144 162 185 154 136 130

   Formulation B: 204 182 140 178 183 163 156 143

   Can you conclude that the mean amount of corrosion differs between the two formulations at 5% level of significance? Verify your results by using MATLAB.