

**ECE 322**  
**SOFTWARE TESTING AND MAINTENANCE**  
**Fall 2021**

---

**Assignment #3**

**Due date: Monday, October 18, 2021 by 11:00 PM**

Total: 40 points

*Value 5 points*

1. Explain a concept of coincidental correctness using a function  $\cos(2x)$  as an example.

*Value 10 points*

2. A credit union is planning to offer new financial products and considers clients being characterized by gender, city dwelling (yes or no), and age group (under 25, between 25 and 65, and over 65). There are four new products: A, B, C, and D. Product A will appeal to male city dwellers. Product B will appeal to young (under 25) males. Product C will appeal to female in-between 25 and 65 who do not live in cities. Product D will appeal to all but males over 65. Construct a decision table for this problem. Answer the following:

- (a) what is the maximal number of rules,
- (b) simplify the table and show a collection of resulting test cases.

*Value 10 points*

3. Propose test cases using the EPC testing strategy and a weak  $n \times 1$  testing strategy for the subdomain described as follows

$$\begin{aligned}x+y &\geq 0 \\ y &< 6 \\ x-y-2 &\leq 0 \\ x &> 1 \\ z &> 0 \\ z &< 6\end{aligned}$$

How many test cases is required to carry out EPC testing strategy for the following subdomain

$$\begin{aligned}x+y &\geq 0 \\ y &< 6 \\ x-y-2 &\leq 0 \\ x &> 1 \\ z &> 0 \\ z &< 6 \\ w &> -1 \\ w &< 20\end{aligned}$$

Value 10 points

4. Discuss the EPC and the weak  $n \times 1$  strategies for testing a system that solves the following quadratic equation

$$ax^2+bx+c=0$$

How useful are these strategies in dealing with this testing problem.

Hint: Is the boundary linear?

Value 5 points

5. The relationships in operational profile can be conveniently presented in the following graph format where the numbers next to the edges of the graph stand for corresponding probabilities. Given the structure where we consider customer, user, and system model profiles, determine an order in which testing should be realized for each of the system model profiles  $f_1, f_2, f_3$ , and  $f_4$ .

