CS 3009: Software Engineering (E)

Quiz 5

Time: 20 minutes Max Marks: 20 Roll No. _____

Q1 **5 + 15 = 20 Marks**

An economics application estimates the human poverty index (HPI) of a country by considering its GDP in billions of US dollars (0.0 – 100.0, 100.0+), its unemployment rate (UR) as a percentage (0.0 – 10.0, 10.1 – 50.0, 50.1 – 100.0), its inflation rate (IR) (low, high), and its average family size (AFS) (very small, small, medium, large, very large). The HPI estimation module of this application uses the estimates shown in the table below.

GDP		0.0 – 100.0						100.0+					
UR		0.0 – 10.0		10.1 – 50.0		50.1 – 100.0		0.0 – 10.0		10.1 – 50.0		50.1 – 100.0	
IR		low	high	low	high	low	high	low	high	low	high	low	high
AFS	very small	14.5	13.5	15.5	15.0	14.0	16.0	10.0	11.0	11.5	12.5	12	13
	small	15.5	14.5	16.5	16.0	15.0	17.0	11.0	12.0	12.5	13.5	13	14
	medium	16.5	15.5	17.5	17.0	16.0	18.0	12.0	13.0	13.5	14.5	14	15
	large	17.5	16.5	18.5	18.0	17.0	19.0	13.0	14.0	14.5	15.5	15	16
	very large	18.5	17.5	19.5	19.0	18.0	20.0	14.0	15.0	15.5	16.5	16	17

a. Use Equivalence Class Partitioning (ECP) and Boundary Value Analysis (BVA) to fill out the first three rows in the following table for black-box testing of the HPI estimation module:

Variable	**Valid ECs**	**Representing values**		**Invalid ECs**	**Representing values for invalid ECs**
		For valid ECs	**BVA based**		
GDP	1. 0.0– 100.0 2. 100.0+	50.0, 0.0, 150.2	0.0, 0.1, 50.0, 99.9, 100.0 100.0, 100.1	Below 0	-1
UR	1. 0.0-10.0 2. 10.1-50.0 3. 50.1-100.0	13.0 38.6 67.0	0.0, 0.1, 5.0, 9.9, 10.0 10.1. 10.2, 30.0, 49.9, 50.0 50.1, 50.2, 75.0, 99.9, 100.0	Below 0 and above 100	-1, 101
IR	1. Low 2. high	Low high	-----	Other than low and high	medium
AFS	(1) very small (2) small (3) medium (4) large (5) very large	very small small medium large very large	----	(1) Values other than very small, small, medium, large, or very large	extra large

b. Design test cases based on **BVA**. Your test cases should cover all ECs. Clearly mention which test case covers which EC. Add more rows if required.

Test case id	Purpose/What to test?	GDP	UR	IR	AFS	Expected Output (HPI)
1.	Test EC1 of GDP	0.0	50	Low	Medium	Corresponding HPI Value
2.	Test EC1 of GDP	0.1	50	High	Medium	Corresponding HPI Value
3.	Test EC1 of GDP	50.0	50	Low	Medium	Corresponding HPI Value
4.	Test EC1 of GDP	99.9	50	High	Medium	Corresponding HPI Value
5.	Test EC1 of GDP	100.0	50	Low	Medium	Corresponding HPI Value
6.	Test EC2 of GDP	100.1	50	Low	Medium	Corresponding HPI Value
7.	Test EC1 of UR	50	0.0	High	Medium	Corresponding HPI Value
8.	Test EC1 of UR	50	0.1	Low	Medium	Corresponding HPI Value
9.	Test EC1 of UR	50	5.0	High	Medium	Corresponding HPI Value
10.	Test EC1 of UR	50	9.9	Low	Medium	Corresponding HPI Value
11.	Test EC1 of UR	50	10.0	High	Medium	Corresponding HPI Value
12.	Test EC2 of UR	50	10.1	Low	Medium	Corresponding HPI Value
13.	Test EC2 of UR	50	10.2	High	Medium	Corresponding HPI Value
14.	Test EC2 of UR	50	30.0	Low	Medium	Corresponding HPI Value
15.	Test EC2 of UR	50	49.9	High	Medium	Corresponding HPI Value
16.	Test EC2 of UR	50	50.0	Low	Medium	Corresponding HPI Value
17.	Test EC3 of UR	50	50.1	High	Medium	Corresponding HPI Value
18.	Test EC3 of UR	50	50.2	Low	Medium	Corresponding HPI Value
19.	Test EC3 of UR	50	75.0	High	Medium	Corresponding HPI Value
20.	Test EC3 of UR	50	99.9	Low	Medium	Corresponding HPI Value
21.	Test EC3 of UR	50	100.0	High	Medium	Corresponding HPI Value
22.						
23.						
24.						
25.						
26.						
27.						
28.						
29.						
30.						