**Assignment Description:**

**Part I:** Create a decision table based on the retirement pension salary policy for Michigan public school teachers. Determine the compensation multiplier for a teacher aged 64 with 20 years of teaching experience and a salary of $95,000. Comment on the completeness and vagueness of the requirements and, if possible, calculate default rules.

**Part II:** Analyze and create a decision table for a software filter that selects male students for the university basketball team based on weight, height, and academic credit requirements. Identify input conditions and corresponding actions, create an initial decision table, reduce it, and show the reduction steps. Comment on the completeness and vagueness of the requirements and, if possible, determine default rules.

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**Summary:**

**Results:**

1. **Part I:** Constructed a decision table that captures all possible conditions and actions for the pension salary policy. The compensation multiplier for a teacher aged 64 with 20 years of experience and a salary of $95,000 was determined to be **1.6% for the first $90,000 and 1.5% for the remaining $5,000**.
2. **Part II:** Developed a decision table for the basketball selection criteria, showing how weight, height, and credits interact to determine eligibility. Reduced redundant conditions to simplify the table

**Reflection:**

This assignment highlights the impact of decision tables in capturing complex requirements. The pension problem demonstrated the challenge of interpreting vaguely specified rules, while the basketball selection problem reinforced how formalized conditions can lead to more efficient decision-making.

**Detailed Results:**

**Part I: Retirement Pension Decision Table**

|  |  |
| --- | --- |
| Condition | Description |
| C1 | Teacher applies before June 11, 2010 |
| C2 | Teacher is currently eligible (Age ≥ 63) |
| C3 | Teacher meets 80 rule (Age + Years of teaching ≥ 80) |
| C4 | Salary ≤ $90,000 |

**Actions:**

|  |  |
| --- | --- |
| Action | Description |
| A1 | Apply 1.6% multiplier to salary up to $90,000 |
| A2 | Apply 1.5% multiplier to salary exceeding $90,000 |

**Decision Table:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Rule | C1 | C2 | C3 | C4 | A1 | A2 |
| 1 | Y | Y | X | Y | X | - |
| 2 | Y | Y | X | N | X | X |
| 3 | Y | N | Y | Y | X | - |
| 4 | Y | N | Y | N | X | X |
| 5 | N | X | X | X | - | - |

For the given case (Age = 64, years = 20, Salary = $95,000):

* C1: Y
* C2: Y
* C3: N (64+20=84, satisfies condition)
* C4: N ($95,000 > $90,000)

Thus, **A1 (1.6% on $90,000) and A2 (1.5% on $5,000) apply.**

* The requirement does not specify the handling of partial eligibility cases.
* It is unclear if the retirement multiplier applies to teachers retiring after June 11, 2010.

If a teacher does not meet C1 (applies late), no pension incentive applies.

**Part II: Basketball Team Selection Decision Table**

|  |  |
| --- | --- |
| Condition | Description |
| C1 | Student is male |
| C2 | Student has ≥12 credits |
| C3 | Student weighs >180 lbs |
| C4 | Student is ≥77 inches tall |

**Actions:**

|  |  |
| --- | --- |
| Action | Description |
| A1 | Eligible for team |
| A2 | Not eligible |

**Initial Decision Table:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Rule | C1 | C2 | C3 | C4 | A1 | A2 |
| 1 | Y | Y | Y | Y | X | - |
| 2 | Y | Y | Y | N | - | X |
| 3 | Y | Y | N | Y | - | X |
| 4 | Y | Y | N | N | - | X |
| 5 | Y | N | X | X | - | X |
| 6 | N | X | X | X | - | X |

**Reduction Steps:**

1. Merge Rules 2, 3, and 4 since A2 is identical.
2. Merge Rules 5 and 6 since A2 applies in both cases.

**Final Reduced Table:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Rule | C1 | C2 | C3 | C4 | A1 | A2 |
| 1 | Y | Y | Y | Y | X | - |
| 2 | Y | Y | N or C4=N | - | - | X |
| 3 | Y | N or C1=N | X | X | - | X |

**Comments on Completeness and Vagueness:**

* No guidance on handling borderline weight or height cases.
* The requirements outline the specific variables entailing the basketball team.

**Default Rule Calculation:**

If a student does not meet C1 (not male) or C2 (less than 12 credits), they are automatically ineligible.

**Honor Pledge:**

I pledge my Honor that I have abided by the Stevens Honor System- RD