

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 ($\text{Age} \geq 63$)
- C3 Teacher meets 80 rule ($\text{Age} + \text{Years of teaching} \geq 80$)
- C4 $\text{Salary} \leq \$90,000$

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 ($\text{Age} = 64$, $\text{years} = 20$, $\text{Salary} = \$95,000$):

- 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