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1. **Case Study**

There is a shop in a city where people buy and sale the computers. There is a huge stock of computers available. A person can only buy a computer if his age is greater than or equal to 20 and the age less than or equal to 40, he must have amount greater than or equal to 20000 and amount less than or equal to 40000 and he must has experience of using computer greater than or equal to 0 years and experience less than or equal to 15 years. Similarly the customer can sale his/her computer. He/she can also repair his/her computer.

1. **Functions**

* Bool isBuy(int age ,int anount, int experience) //returns answer yes or no …required function
  + 20<=age<=40
  + 20000<=amount<=40000
  + 5<=experience<=15
* Bool isSale(int age , int experience)
* Bool isRepaire(int age , int experience)

1. **Worst Case BVA**

Worst case will make all possible combination of 5 values from each set

* age = {20,21,25,39,40}
* amount = {20000,20001,30000,39999,40000}
* experience= {5,6,10,14,15}

5^n => 5^3 =125

1. **Worse Test Cases**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| case | age | amount | experience | output |
| 1 | 20 | 20000 | 5 | yes |
| 2 | 20 | 20000 | 21 | yes |
| 3 | 20 | 20000 | 25 | yes |
| 4 | 20 | 20000 | 39 | yes |
| 5 | 20 | 20000 | 40 | yes |
| 6 | 20 | 20001 | 5 | yes |
| 7 | 20 | 20001 | 21 | yes |
| 8 | 20 | 20001 | 25 | yes |
| 9 | 20 | 20001 | 39 | yes |
| 10 | 20 | 20001 | 40 | yes |
| 11 | 20 | 30000 | 5 | yes |
| 12 | 20 | 30000 | 21 | yes |
| 13 | 20 | 30000 | 25 | yes |
| 14 | 20 | 30000 | 39 | yes |
| 15 | 20 | 30000 | 40 | yes |
| 16 | 20 | 39999 | 5 | yes |
| 17 | 20 | 39999 | 21 | yes |
| 18 | 20 | 39999 | 25 | yes |
| 19 | 20 | 39999 | 39 | yes |
| 20 | 20 | 39999 | 40 | yes |
| 21 | 21 | 40000 | 5 | yes |
| 22 | 21 | 40000 | 21 | yes |
| 23 | 21 | 40000 | 25 | yes |
| 24 | 21 | 40000 | 39 | yes |
| 25 | 21 | 40000 | 40 | yes |
| 26 | 21 | 20000 | 5 | yes |
| 27 | 21 | 20000 | 21 | yes |
| 28 | 21 | 20000 | 25 | yes |
| 29 | 21 | 20000 | 39 | yes |
| 30 | 21 | 20000 | 40 | yes |
| 31 | 21 | 20001 | 5 | yes |
| 32 | 21 | 20001 | 21 | yes |
| 33 | 21 | 20001 | 25 | yes |
| 34 | 21 | 20001 | 39 | yes |
| 35 | 21 | 20001 | 40 | yes |
| 36 | 21 | 30000 | 5 | yes |
| 37 | 21 | 30000 | 21 | yes |
| 38 | 21 | 30000 | 25 | yes |
| 39 | 21 | 30000 | 39 | yes |
| 40 | 21 | 30000 | 40 | yes |
| 41 | 25 | 39999 | 5 | yes |
| 42 | 25 | 39999 | 21 | yes |
| 43 | 25 | 39999 | 25 | yes |
| 44 | 25 | 39999 | 39 | yes |
| 45 | 25 | 39999 | 40 | yes |
| 46 | 25 | 40000 | 5 | yes |
| 47 | 25 | 40000 | 21 | yes |
| 48 | 25 | 40000 | 25 | yes |
| 49 | 25 | 40000 | 39 | yes |
| 50 | 25 | 40000 | 40 | yes |
| 51 | 25 | 20000 | 5 | yes |
| 52 | 25 | 20000 | 21 | yes |
| 53 | 25 | 20000 | 25 | yes |
| 54 | 25 | 20000 | 39 | yes |
| 55 | 25 | 20000 | 40 | yes |
| 56 | 25 | 20001 | 5 | yes |
| 57 | 25 | 20001 | 21 | yes |
| 58 | 25 | 20001 | 25 | yes |
| 59 | 25 | 20001 | 39 | yes |
| 60 | 25 | 20001 | 40 | yes |

* **Strong robust equivalence class partitioning**

1. **Bool isBuy(int age ,int anount, int experience) //returns answer yes or no function**
   * 20<=age<=40
   * 20000<=amount<=40000
   * 0<=experience<=20
   * **Classes // changes done after receiving feedback**

Consider age as: 20 to 23, 24 to 27, 28 to 31, 32 to 35, and 36 to 40

Consider amount as: 20000 to 23000, 24000 to 27000, 28000 to 31000, 32000 to 35000, and 36000 to 40000

Consider experience as: 0 to 2, 3 to 5, 6 to 8, 10 to 12, and 13 to 15

* **Test Cases for Bool isBuy(int age ,int anount, int experience)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| case | age | amount | experience | output |
| 1 | 19 | 19000 | -1 | yes |
| 2 | 19 | 19000 | 1 | yes |
| 3 | 19 | 19000 | 3 | yes |
| 4 | 19 | 19000 | 6 | yes |
| 5 | 19 | 19000 | 10 | yes |
| 6 | 19 | 19000 | 13 | yes |
| 7 | 19 | 19000 | 16 | yes |
| 8 | 19 | 21000 | -1 | yes |
| 9 | 19 | 21000 | 1 | yes |
| 10 | 19 | 21000 | 3 | yes |
| 11 | 19 | 21000 | 6 | yes |
| 12 | 19 | 21000 | 10 | yes |
| 13 | 19 | 21000 | 13 | yes |
| 14 | 19 | 21000 | 16 | yes |
| 15 | 19 | 25000 | -1 | yes |
| 16 | 19 | 25000 | 1 | yes |
| 17 | 19 | 25000 | 3 | yes |
| 18 | 19 | 25000 | 6 | yes |
| 19 | 19 | 25000 | 10 | yes |
| 20 | 19 | 25000 | 13 | yes |
| 21 | 19 | 25000 | 16 | yes |
| 22 | 19 | 29000 | -1 | yes |
| 23 | 19 | 29000 | 1 | yes |
| 24 | 19 | 29000 | 3 | yes |
| 25 | 19 | 29000 | 6 | yes |
| 26 | 19 | 29000 | 10 | yes |
| 27 | 19 | 29000 | 13 | yes |
| 28 | 19 | 29000 | 16 | yes |
| 29 | 19 | 330000 | -1 | yes |
| 30 | 19 | 330000 | 1 | yes |
| 31 | 19 | 330000 | 3 | yes |
| 32 | 19 | 330000 | 6 | yes |
| 33 | 19 | 330000 | 10 | yes |
| 34 | 19 | 330000 | 13 | yes |
| 35 | 19 | 330000 | 16 | yes |
| 36 | 19 | 37000 | -1 | yes |
| 37 | 19 | 37000 | 1 | yes |
| 38 | 19 | 37000 | 3 | yes |
| 39 | 19 | 37000 | 6 | yes |
| 40 | 19 | 37000 | 10 | yes |
| 41 | 19 | 37000 | 13 | yes |
| 42 | 19 | 37000 | 16 | yes |
| 43 | 19 | 41000 | -1 | yes |
| 44 | 19 | 41000 | 1 | yes |
| 45 | 19 | 41000 | 3 | yes |
| 46 | 19 | 41000 | 6 | yes |
| 47 | 19 | 41000 | 10 | yes |
| 48 | 19 | 41000 | 13 | yes |
| 49 | 19 | 41000 | 16 | yes |
| 50 | 20 | 19000 | -1 | yes |
| 51 | 20 | 19000 | 1 | yes |
| 52 | 20 | 19000 | 3 | yes |
| 53 | 20 | 19000 | 6 | yes |
| 54 | 20 | 19000 | 10 | yes |
| 55 | 20 | 19000 | 13 | yes |
| 56 | 20 | 19000 | 16 | yes |
| 57 | 20 | 21000 | -1 | yes |
| 58 | 20 | 21000 | 1 | yes |
| 59 | 20 | 21000 | 3 | yes |
| 60 | 20 | 21000 | 6 | yes |
| 61 | 20 | 21000 | 10 | yes |
| 62 | 20 | 21000 | 13 | yes |
| 63 | 20 | 21000 | 16 | yes |
| 64 | 20 | 25000 | -1 | yes |
| 65 | 20 | 25000 | 1 | yes |
| 66 | 20 | 25000 | 3 | yes |
| 67 | 20 | 25000 | 6 | yes |
| 68 | 20 | 25000 | 10 | yes |
| 69 | 20 | 25000 | 13 | yes |
| 70 | 20 | 25000 | 16 | yes |
| 71 | 20 | 29000 | -1 | yes |
| 72 | 20 | 29000 | 1 | yes |
| 73 | 20 | 29000 | 3 | yes |
| 74 | 20 | 29000 | 6 | yes |
| 75 | 20 | 29000 | 10 | yes |
| 76 | 20 | 29000 | 13 | yes |
| 77 | 20 | 29000 | 16 | yes |
| 78 | 20 | 330000 | -1 | yes |
| 79 | 20 | 330000 | 1 | yes |
| 80 | 20 | 330000 | 3 | yes |
| 81 | 20 | 330000 | 6 | yes |
| 82 | 20 | 330000 | 10 | yes |
| 83 | 20 | 330000 | 13 | yes |
| 84 | 20 | 330000 | 16 | yes |
| 85 | 20 | 37000 | -1 | yes |
| 86 | 20 | 37000 | 1 | yes |
| 87 | 20 | 37000 | 3 | yes |
| 88 | 20 | 37000 | 6 | yes |
| 89 | 20 | 37000 | 10 | yes |
| 90 | 20 | 37000 | 13 | yes |
| 91 | 20 | 37000 | 16 | yes |
| 92 | 20 | 41000 | -1 | yes |
| 93 | 20 | 41000 | 1 | yes |
| 94 | 20 | 41000 | 3 | yes |
| 95 | 20 | 41000 | 6 | yes |
| 96 | 20 | 41000 | 10 | yes |
| 97 | 20 | 41000 | 13 | yes |
| 98 | 20 | 41000 | 16 | yes |

1. **Bool isSale(int age , int experience) //returns answer yes or no function**
   * **Classes // changes done after receiving feedback**

* Consider age as: 20 to 23, 24 to 27, 28 to 31, 32 to 35, and 36 to 40
* Consider experience as: 0 to 2, 3 to 5, 6 to 8, 10 to 12, and 13 to 15
* **Test cases for Bool isSale(int age , int experience)**

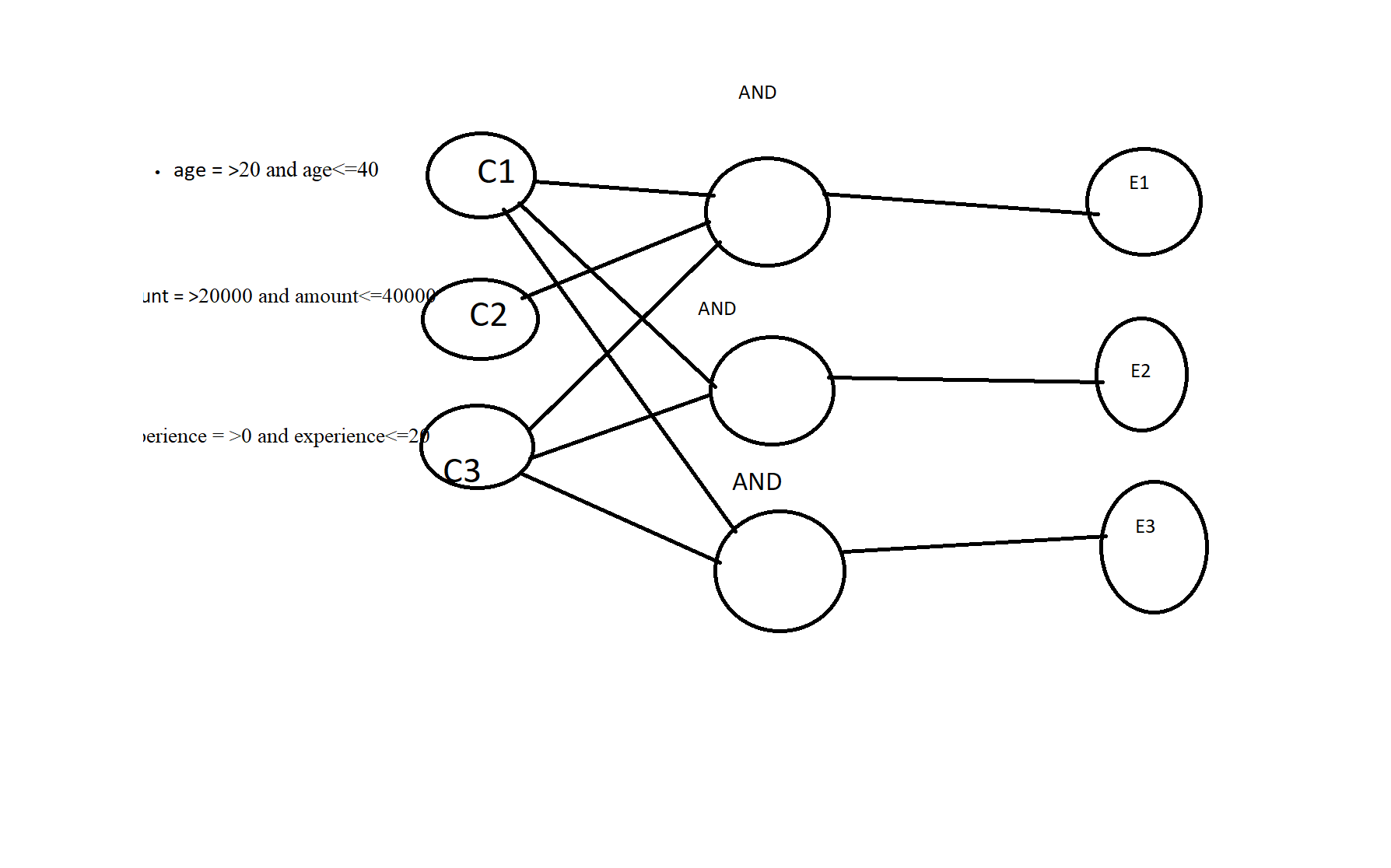
|  |  |  |  |
| --- | --- | --- | --- |
| case | age | experience | output |
| 1 | 19 | -1 | yes |
| 2 | 19 | 1 | yes |
| 3 | 19 | 3 | yes |
| 4 | 19 | 6 | yes |
| 5 | 19 | 10 | yes |
| 6 | 19 | 13 | yes |
| 7 | 19 | 16 | yes |
| 8 | 21 | -1 | yes |
| 9 | 21 | 1 | yes |
| 10 | 21 | 3 | yes |
| 11 | 21 | 6 | yes |
| 12 | 21 | 10 | yes |
| 13 | 21 | 13 | yes |
| 14 | 21 | 16 | yes |
| 15 | 25 | -1 | yes |
| 16 | 25 | 1 | yes |
| 17 | 25 | 3 | yes |
| 18 | 25 | 6 | yes |
| 19 | 25 | 10 | yes |
| 20 | 25 | 13 | yes |
| 21 | 25 | 16 | yes |
| 22 | 29 | -1 | yes |
| 23 | 29 | 1 | yes |
| 24 | 29 | 3 | yes |
| 25 | 29 | 6 | yes |
| 26 | 29 | 10 | yes |
| 27 | 29 | 13 | yes |
| 28 | 29 | 16 | yes |
| 29 | 33 | -1 | yes |
| 30 | 33 | 1 | yes |
| 31 | 33 | 3 | yes |
| 32 | 33 | 6 | yes |
| 33 | 33 | 10 | yes |
| 34 | 33 | 13 | yes |
| 35 | 33 | 16 | yes |
| 36 | 37 | -1 | yes |
| 37 | 37 | 1 | yes |
| 38 | 37 | 3 | yes |
| 39 | 37 | 6 | yes |
| 40 | 37 | 10 | yes |
| 41 | 37 | 13 | yes |
| 42 | 37 | 16 | yes |
| 43 | 41 | -1 | yes |
| 44 | 41 | 1 | yes |
| 45 | 41 | 3 | yes |
| 46 | 41 | 6 | yes |
| 47 | 41 | 10 | yes |
| 48 | 41 | 13 | yes |
| 49 | 41 | 16 | yes |

1. **Bool isRepaire(int age , int experience) //returns answer yes or no function**
   * **Classes // changes done after receiving feedback**

* Consider age as: 20 to 23, 24 to 27, 28 to 31, 32 to 35, and 36 to 40
* Consider experience as: 0 to 2, 3 to 5, 6 to 8, 10 to 12, and 13 to 15
* **Test Cases for Bool isRepaire(int age , int experience)**

|  |  |  |  |
| --- | --- | --- | --- |
| case | age | experience | output |
| 1 | 19 | -1 | yes |
| 2 | 19 | 1 | yes |
| 3 | 19 | 3 | yes |
| 4 | 19 | 6 | yes |
| 5 | 19 | 10 | yes |
| 6 | 19 | 13 | yes |
| 7 | 19 | 16 | yes |
| 8 | 21 | -1 | yes |
| 9 | 21 | 1 | yes |
| 10 | 21 | 3 | yes |
| 11 | 21 | 6 | yes |
| 12 | 21 | 10 | yes |
| 13 | 21 | 13 | yes |
| 14 | 21 | 16 | yes |
| 15 | 25 | -1 | yes |
| 16 | 25 | 1 | yes |
| 17 | 25 | 3 | yes |
| 18 | 25 | 6 | yes |
| 19 | 25 | 10 | yes |
| 20 | 25 | 13 | yes |
| 21 | 25 | 16 | yes |
| 22 | 29 | -1 | yes |
| 23 | 29 | 1 | yes |
| 24 | 29 | 3 | yes |
| 25 | 29 | 6 | yes |
| 26 | 29 | 10 | yes |
| 27 | 29 | 13 | yes |
| 28 | 29 | 16 | yes |
| 29 | 33 | -1 | yes |
| 30 | 33 | 1 | yes |
| 31 | 33 | 3 | yes |
| 32 | 33 | 6 | yes |
| 33 | 33 | 10 | yes |
| 34 | 33 | 13 | yes |
| 35 | 33 | 16 | yes |
| 36 | 37 | -1 | yes |
| 37 | 37 | 1 | yes |
| 38 | 37 | 3 | yes |
| 39 | 37 | 6 | yes |
| 40 | 37 | 10 | yes |
| 41 | 37 | 13 | yes |
| 42 | 37 | 16 | yes |
| 43 | 41 | -1 | yes |
| 44 | 41 | 1 | yes |
| 45 | 41 | 3 | yes |
| 46 | 41 | 6 | yes |
| 47 | 41 | 10 | yes |
| 48 | 41 | 13 | yes |
| 49 | 41 | 16 | yes |

* 1. **List down requirements in form of causes and effects**
  + C1 : age = >20 and age<=40
  + C2 : amount = >20000 and amount<=40000
  + C3: experience = >0 and experience<=20
  + E1: Yes (buys computer)
  + E2: Yes (sales computer)
  + E3: Yes ( repairs computer )
  1. **Draw cause effect graphs**

****

* 1. **Decision table**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | 1 | 2 |
| Condition / Cause | **C1** age = >20 and age<=40 | 1 | 1 |
| Condition / Cause | **C2** amount = >20000 and amount<=40000 | 1 | 0 |
| Condition / Cause | **C3** experience = >0 and experience<=20 | 1 | 1 |
| Action / Effect | E1 | X | - |
| Action / Effect | E2 | - | X |
| Action / Effect | E3 | - | X |
| Action / Effect | E4 | - | - |

* 1. **Identify test cases**
* Since there are 2 rules in our decision table above, so we must have at least 2 test cases to test this system using this technique.

These test cases can be  
  
1. Age = 25, amount = 25000, experience =10.  
1. Age = 27, experience =17.

* 1. **Draw a table to mention test case number, test data and expected output**
* **Boundary Value Analysis**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| case | age | amount | experience | output |
| 1 | 30 | 30000 | 0 | Yes |
| 2 | 30 | 30000 | 1 | Yes |
| 3 | 30 | 30000 | 10 | Yes |
| 4 | 30 | 30000 | 19 | Yes |
| 5 | 30 | 30000 | 20 | Yes |
| 6 | 30 | 20000 | 10 | Yes |
| 7 | 30 | 20001 | 10 | Yes |
| 8 | 30 | 39999 | 10 | Yes |
| 9 | 30 | 40000 | 10 | Yes |
| 10 | 20 | 30000 | 10 | Yes |
| 11 | 21 | 30000 | 10 | Yes |
| 12 | 39 | 30000 | 10 | Yes |
| 13 | 40 | 30000 | 10 | Yes |