Andrew So

***Section 1-1: 35, 37, 61-64***

35. Consider the following pseudo code:

Repeat

i=1

Read a value for x

If ((x<5.0) and (2x<10.7)) or (sqrt(5x) > 5.1) then

Write value of x

End if

Increase I by 1

Until i>5

The values x are: 1.0, 5.1, 2.4, 7.2, and 5.3. What are the output values?

* 1.0, 2.4, 7.2, 5.3

37. Rewrite the following statement form with a simplified conditional expression, where the function odd(n) returns true in n is odd.

If not((value1<value2) or odd(Num)) or (not(value1<value2)) then

Statement 1

Else

Statement2

End if

* If not(value1<value2) then

statement 1

else

statement 2

end if

In Ex 61 -64, you are traveling in a certain country where every individual is either a truth teller who always tells the truth or a liar who always lies.

61. You meet two inhabitants of this country, Percival and Llewelyn. Percival says, “At least one of us is a liar.” Is Percival a lair or a truth teller? What about Llewellyn? Explain your answer.

* If Percival lied, then the statement would have been true. This would be a contradiction.
* If the statement was true, the Percival could not have lied as he could not tell the truth.
* If Percival told the truth, then by process of elimination, Llewelyn is a liar.
* Therefore, Percival is a truth teller while Llewelyn is the liar.

62. Traveling on, you meet Merlin and Meredith. Merlin says, “If I am a truth teller, then Meredith is a truth teller? Is Merlin a lair or truth teller? What about Meredith?

|  |  |  |
| --- | --- | --- |
| **Merlin** | **Meredith** | **Implies** |
| **T** | **T** | **T** |
| **T** | **F** | **F** |
| **F** | **T** | **T** |
| **F** | **F** | **T** |

* If we assume Merlin was lying, we can rely on the truth table above. He would have still told the truth. Contradiction.
* So if Merlin was telling the truth then by the implication statement that Meredith is a truth teller.
* Therefore they are both truth tellers.

63. Next, you meet Rothwold and Grymlin. Rothwold says, “Either I am a liar or Grymlin is a truth teller.” Is Roth a liar or truth teller? What about Grymlin? Explain.

* Based off the statement above, we can determine it’s a disjunction.
* If we assume Roth is a liar then it would contradict his statement by telling the truth of him being a liar.
* If Roth was telling the truth, it would imply Grymlin is a truth teller.
* So, both are truth tellers.

64. Finally, you meet Gwendolyn and Merrilaine. Gwendolyn says, “I’m a liar but Merrilaine is not.” Is Gwendolyn a liar or truth teller? What about Merrilaine?

* Based off the statement, we can determine that this is a conjunction. If Gwendolyn lied, then he would have told the truth which contradicts him being a liar. It would have implied that Merrilaine was a truth teller.
* If Gwendolyn was telling the truth then Merrilaine is a liar because he lied that Merrilaine is not a liar. He tells the truth by implying that he lied about Merrilanine’s status. Gwen lied.
* There both liars.