

Worksheet 3 Solution

March 11, 2020

Question 1

Part 1

- a) $Correct(my_prog) \wedge Python(my_prog)$
- b) $\exists x \in P, \neg Correct(x) \Rightarrow Python(x)$
- c) $\forall x \in P, \neg Python(x) \Rightarrow Correct(x)$
- d) $\forall x \in P, \neg Correct(x) \Rightarrow Correct(x)$
- e) A program is written in Python and is correct
- f) All programs are not written in Python and is correct
- g) It is not true that all programs written in python is correct
- h) All programs that are not written in python is correct, and all correctly running programs are not written in python

Question 2

- a) All program written in Python is correct, or all program written in Python is not correct
- b) $(\exists x \in P, Python(x) \Rightarrow Correct(x)) \Rightarrow (\forall y \in P, Python(x) \Rightarrow Correct(x))$

- c) The first statement considers two different natural numbers, where as the second uses the same number

The first statement is True (with $x_1 = 5$ and $x_2 = 35$), but the second statement is False (165 cannot be in multiples of 7)

Question 3

- a) $Odd(x) : \exists n \in \mathbb{Z}, 2 \mid (n + 1)$
b) $(\forall m \in \mathbb{Z}, Odd(m)) \wedge (\forall n \in \mathbb{Z}, Odd(n)) \Rightarrow Odd(mn)$

Question 4

Question 5