CIS 623 Structured Programming and Formal Methods – Assignment 4

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Winter 2021

1. Find the weakest precondition

   wp(x=x+y, !(x>y))

   wp = !((x+y)>y)

   wp = !(x>0)

2. Which of the following is valid?

   [x<y] x=x+y [!(x>y)] – not valid (if x=1 and y=2)

   [!(x>y)] x=x+y [!(x>y)] – not valid (if x=1 and y=2)

   [(x+3<0)] x=x+y [!(x>y)] – valid

3. Find the weakest precondition

   wp(if y>0 then x=x+y else x=x-y, x>10)

   wp = (y>0 -> x+y>10) or (!(y>0) -> x-y>10)

   wp = (x + y > 10) or (x – y >10)

   wp = x + |y| > 10

4. Which of the following is valid

   [x+y>10] if y>0 then x=x+y else x=x-y [x>10] - valid

   [x>10] if y>0 then x=x+y else x=x-y [x>10] - valid

   [y>10] if y>0 then x=x+y else x=x-y [x>10] – not valid (if x=-1 and y=11)