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19CSE105 – Program Reasoning – Assignment-5

1. Working with Frama-c by writing functions for the following cases, defining specifications (pre-condition and post-condition) and verify them: -
   - i) Skip statement
   - ii) Assignment statement
   - iii) Sequence/Block of statements
   - iv) Conditional Statements (if…..else)
2. Use the following ACSL constructs to define specifications suitably and verify them with relevant functions: -
   - i) ensures
   - ii) requires
   - iii) assigns
   - iv) \old
   - v) \valid
   - vi) behavior & assumes
   - vii) complete behaviors & disjoint behaviors
   - viii) assert
3. Obtain Weakest Precondition (P) for each of the following codes (S) for the given Postcondition (Q): -

i)

P	
S	x = 5
Q	y > x

ii)

P	
S	x = z + 1; y = x + 5;
Q	y > 5

iii)

P	
S	if (y < 0) x = y + 1;
Q	x > 0

iv)

P	

S	if (y < 0)
	  x = y + 1;
	else
	  x = y - 1;

Q	x < 0

4. Verify the correctness of precondition obtained for each of the codes (S) given in Q.No. 3. i)….3. iv) using frama-c or frama-c-gui tools.

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