**IIT CS536: Science of Programming**

Homework 4: WP and SP

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**Task 1.1**

Let' s calculate them separately.

1. Now we just calculate

**Task 1.2**

In order to say anything about the relation we should understand what the expression on the left side means. Is the weakest liberal predondition is the same if postcondition of the program is the strongest postcondition when program is run with initial state P. I believe this is not the case as weakest liberal precondition includes precondition in which S may not terminate or result in bottom. In those cases we cannot guarantee that since if there are cases when program does not terminate then it will just result in T. So, it’s not always the case and depends on the program.

**Task 2.1**

**Task 2.2**

to answer this question let’s look at the components: gives us weakest liberal precondition in which S terminates and satisfies Q or S does not terminate. But gives us the strongest postcondition which holds if S terminates where precondition was . being . As wlp considers cases when S does not terminate when we use this as precondition for sp() it will not guarantee Q since it only cares about cases where S terminates and finds a strongest postcondition which will be satisfied after termination. So is not always the case.

**Task 3.1**

I spent around 5 hours on this assignment.