

AMRITA SCHOOL OF ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE ENGINEERING

19CSE205 - Program Reasoning

LAB ASSIGNMENT-6

Class: 3rd Semester CSE-E

Course Faculty: Dr.S.Padmavathi

DATE: 15-9-2020

HW Assignment CO-2

MARKS:20

CO1	Understand the necessity of proving correctness of programs with respect to formal specification or property
CO2	Apply program verification techniques to prove and analyze correctness of programs.
CO3	Understand the problems associated with concurrent programs and their effects on their behavioural correctness
CO4	Understand and use few state-of-the-art tools to model and verify sequential and concurrent systems.

PART-A (each 5 marks).

Identify the invariant.

Identify suitable B and initialization

Derive and verify Intra loop and exit loop conditions.

Derive the Precondition I

Write the suitable conditions for Total Correctness.

```
1.
{I}
[initialization]
While(B)
{
    i=i+1;
    s=s+i;
}
{O: s=n*(n+1)/2}
```

2.

```
{I}  
[initialization]  
While(B)  
{  
    i=i+1;  
    s=s+i*i;  
}  
{O:  $s=n*(n+1)*(2*n+1)/6$ }
```

3.

```
{I}  
[initialization]  
While(B)  
{  
    i=i+1;  
    s=s+i*i;  
}  
{O:  $s=(1*1)+(2*2)+\dots+(n*n)$ }
```

4. {I}
[initialization]
While(B)
{
 i=i+1;
 s=s*i;
}
{O: $s=1*2*\dots*n$ }

Install Frama C :

Follow the instructions given

For linux, Ubuntu, window 10, Mac- Frama –C installation

<https://www.frama-c.com/install-19.0-Potassium.html>

for windows issues during installation

<https://github.com/Frama-C/Frama-C-snapshot/issues>

[for Windows 10 –Frama-C installation through WSL](#)

For enabling WSL on Windows, you may follow these instructions:

<https://docs.microsoft.com/en-us/windows/wsl/install-win10>

Ubuntu 20.04 install: Windows 10 using VMware Player

<https://www.youtube.com/watch?v=B1tCRwkFmnA&feature=youtu.be>