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Name #3: \_\_\_\_\_

TCSS 462/562: (Software Engineering for) Cloud Computing  
Fall 2023

School of Engineering and Technology  
University of Washington – Tacoma

## Class Activity 1 – Implicit vs. Explicit Parallelism

Thursday October 5<sup>th</sup>, 2023

We've discussed four types of parallelism:

- ☐ Thread Level Parallelism (TLP)
- ☐ Data-level Parallelism
- ☐ Bit-level parallelism
- ☐ Instruction level parallelism.

1. Which two types of parallelism are *implicit*, in that they come for free without any special efforts required by programmers to use them? Why are these methods available automatically without special developer effort?
  
  
  
  
  
  
  
  
  
  
2. Which two types of parallelism are *explicit*, in that they require manual programmer effort to reap benefits? Why do these methods require manual effort?
  
  
  
  
  
  
  
  
  
  
3. List advantages of *implicit* approaches to parallelism?

4. List disadvantages of *implicit* approaches to parallelism?
  
5. List advantages of *explicit* approaches to parallelism:
  
6. List disadvantages of *explicit* approaches to parallelism:
  
7. For *bit-level* parallelism, should a developer be concerned with the available number of virtual CPU processing cores when choosing a cloud-based virtual machine if wanting to obtain the best possible speed-up? (Yes / No)
8. For *instruction-level* parallelism, should a developer be concerned with the physical CPU's architecture used to host a cloud-based virtual machine if wanting to obtain the best possible speed-up? (Yes / No)
9. For *thread level parallelism* (TLP) where a programmer has spent considerable effort to parallelize their code and algorithms, what consequences result when this code is deployed on a virtual machine with too few virtual CPU processing cores?

What happens when this code is deployed on a virtual machine with too many virtual CPU processing cores?