Name #1: _____

Name #2: _____

Name #3: _____

TCSS 462/562: (Software Engineering for) Cloud Computing   School of Engineering and Technology
Fall 2024   University of Washington – Tacoma

Class Activity 1 – Implicit vs. Explicit Parallelism
Thursday October 3th, 2024

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?

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 design/architecture used to host a cloud-based virtual machine if wanting to obtain the best possible speed-up? (Yes / No)

9. An application developer measures the average and peak *thread level parallelism* (TLP) of an application prior to deployment on the AWS EC2. The developer measures an average TLP of 2.3, and a peak TLP of 7.3. The application is to be deployed using a compute-optimized (c-series) ec2 instance. Using resources online, such as the websites below, propose a good virtual machine (ec2 type) that satisfies average TLP, and a second for satisfying peak TLP.
https://docs.aws.amazon.com/ec2/latest/instancetypes/co.html
https://instances.vantage.sh/

good ec2 c-series instance for average TLP: _____

why is this instance good/sufficient for average TLP?

good ec2 c-series instance for peak TLP: _____

why is this instance good/sufficient for peak TLP?