Started on	Sunday, 7 April 2024, 11:13 AM
State	Finished
Completed on	Sunday, 7 April 2024, 11:18 AM
Time taken	5 mins 42 secs
Grade	**4.00** out of 4.00 (**100**%)
Feedback	Well done!

Question 1

Correct

Mark 1.00 out of 1.00

Which of the following assertions are true?

- [x] a. A way to reduce the execution time of a program would be to split the program into discrete parts, to be called *tasks*, and use multiple processors (CPUs or cores) to execute them at the same time. ✔
- [x] b. task ✔
  /tɑːsk/
  noun
  1. a piece of work to be done or undertaken.
- [ ] c. Tasks can always be executed in parallel.

Your answer is correct.

The correct answers are:
A way to reduce the execution time of a program would be to split the program into discrete parts, to be called *tasks*, and use multiple processors (CPUs or cores) to execute them at the same time.,

task
/tɑːsk/
noun
1. a piece of work to be done or undertaken.

Question 2

Correct

Mark 1.00 out of 1.00

We have a sequential code which calculates the number of appearances of some value in a vector. In order to paralelize the code we subdivide the problem into several tasks which can work independently, each accumulating the partial result which they compute in a private variable. Is there anything else which needs to be done in our parallel program?

a. No, nothing else needs to be done once all tasks have computed the part of the work assigned to them.

b. Yes, at the end of the computation, all partial results need to be aggregated into a single common variable. This is called a *reduction*. ✔ Well done! Very often parallel programs need to apply a reduction pattern.

c. Yes, at the end of the computation, all partial results need to be written to a file.

Your answer is correct.

Reductions are patterns that appear very often in parallel programs. They imply some *overhead* with respect to the original sequential code due to the additional work needed to perform them.

The correct answer is:
Yes, at the end of the computation, all partial results need to be aggregated into a single common variable. This is called a *reduction*.

Question 3

Correct

Mark 1.00 out of 1.00

Very often, towards the end of the computation, partial results computed in parallel need to be combined into a single common variable. In order to obtain the final result we need to apply the same operation that was applied in each parallel task contributing to the solution. This is called a *reduction*.

If we use P processors in the execution of our parallel code which has a reduction, which is the expected parallel execution time T_p ?

a. $T_P = T_1 / P$

b. $T_P = T_1 / P + T_{ovh}(P)$ ✔ Well done!

Your answer is correct.

Reductions imply some overhead with respect to the original sequential code due to the additional work needed to perform them.

The correct answer is:
$T_P = T_1 / P + T_{ovh}(P)$

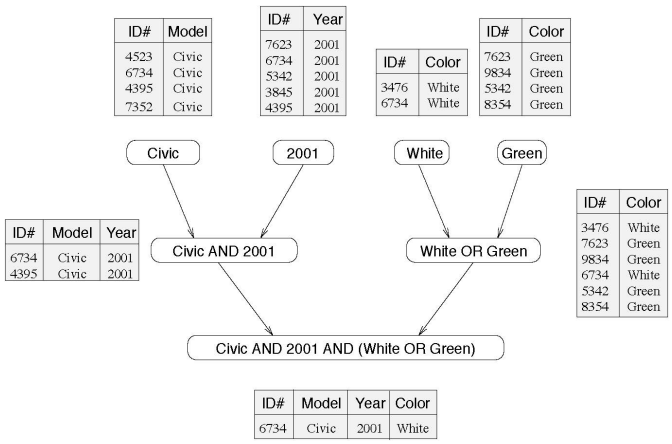
Question 4

Correct

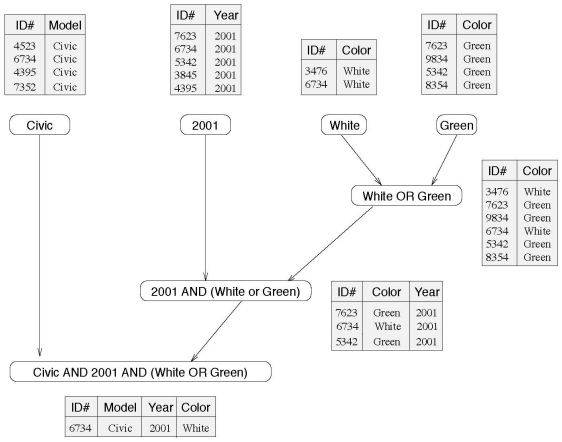
Mark 1.00 out of 1.00

Given the following two query plans discussed in the last video lesson:

- First query plan:



- Second query plan:



If all tasks take the same time to execute, which of the two query plans provides more opportunities to execute tasks in parallel? Or in other words, which one would reduce more the total execution time if an unlimited number of processors were available?

Select one:

- I don't have enough information to answer this question.
- Query plan 1. ✔ Well done! The 2nd query plan requires 4 consecutive steps to complete, while the 1st query plan only requires 3, finishing its execution faster.
- Query plan 2.
- Both provide the same opportunities.

The correct answer is: Query plan 1.