✓ **Congratulations! You passed!**

Next Item

✔ **1.** Suppose we are operating on a 1D vector. Which of the following operation is **not** data parallel over the vector elements?

1 / 1 point

✔ **2.** (True/False) A single mapper call can emit multiple (key,value) pairs.

1 / 1 point

✔ **3.** (True/False) More than one reducer can emit (key,value) pairs with the same key simultaneously.

1 / 1 point

✔ **4.** (True/False) Suppose we are running k-means using MapReduce. Some mappers may be launched for a new k-means iteration even if some reducers from the previous iteration are still running.

1 / 1 point

✔ **5.** Consider the following list of binary operations. Which can be used for the reduce step of MapReduce? Choose all that apply.

1 / 1 point

Hints: The reduce step requires a binary operator that satisfied **both** of the following conditions.

- Commutative: $OP(x_1, x_2) = OP(x_2, x_1)$
- Associative: $OP(OP(x_1, x_2), x_3) = OP(x_1, OP(x_2, x_3))$

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