## **What is an algorithm?**

Algorithms are routinely used by both machines and humans to make decisions or complete tasks throughout our daily lives. For example, yahoo and Google's search algorithm go through billions of web pages to look for relevant or desired information in a matter of milliseconds. Similarly, Uber uses algorithm to find the closest diver to you and tells the driver to take the fastest route to your destination. Although the word “Algorithm” sounds intimidating, its simply a set of instructions or step-by-step process that computers follow to arrive at an answer. Understanding the process of building an algorithm can help you build a strong foundation in logical thinking and problem solving. An algorithm is a detailed, step-by-step process followed in order to accomplish a specific task or to solve a specific problem. For example, algorithm is like a recipe when you are cooking or your morning routine. Your morning routine could be the following:

1. Wake up and turn off alarm
2. Get dressed
3. Brush teeth
4. Eat breakfast
5. Go to school

Question: Write 3 examples of an algorithm

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2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Assume you are planning a journey to Time Square, What are the different factors you might consider before your trip?

* 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Which of the following is NOT something we are concerned with when we write an algorithm?  
 a) The algorithm is short.  
 b) The algorithm is correct.  
 c) The algorithm is efficient.  
 d) The algorithm is understandable.

***Shortest Path Problem***

Have you ever used a Maps to find the shortest route to your destination or least amount of time to get from one point to another? If so, then you're already familiar with the shortest path problem. In math terms, this is a way to find the shortest possible distance between two vertices (or nodes) on a graph. Suppose we're trying to find the shortest path from your house to your friend's house. You know the distances between different locations in your neighborhood. These different locations are called vertices and the routes (path) between them are called edges, we can create a weighted graph representing the situation. Dijkstra's algorithm is a step-by-step process we can use to find the shortest path between two vertices in a weighted graph. This algorithm enables us to find shortest distances and minimum costs, and latency making it a valuable tool.

1. When you plan a journey, List 3 different factors you might consider:

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1. In your own words define
   1. Vertices
   2. Edges

