CSAP Associate Sales Engineer Assessment

Format of Activity

The first 30 minutes of your assessment will be a behavioural based Q&A with an assessor. Please be prepared to discuss your resume, experience and questions. Please ensure you do your research on the program and the position.

The second 30 minutes of your interview will consist of a software assessment.

In order to prepare for the assessment, please review and solve the questions below. Come prepared to share your solutions and explain your process during the interview. If you feel you need some clarity on any of the questions, please consider making some assumptions to provide answers and we will discuss your work together during the interview.

You will need to share your screen via WebEx– the interviewer will assist with the process. Please be prepared to compile/interpret the code you have written in response to the questions. Be aware there may be a few additional follow up questions following the formal assessment.

Note: These questions are in Python, but you are welcome to complete the assessment in any language you prefer.

1. Write a function that will convert a JSON-formatted string to a dictionary. For instance, the function will take this string as a parameter:

   "{'totalCount':'1','ID':'1029','IP':'10.0.0.1'}"

   And will return a dictionary called “result” that will have the following values:

   result[“totalCount”] = “1”
   result[“ID”] = “1029”
   result[“IP”] = “10.0.0.1”

   This exercise should be completed without using the “json” library or anything similar. Please produce the desired output as shown above by parsing and manipulating the input string. There will be no nesting within the JSON string. Your code should be flexible enough to create a dictionary from a JSON-formatted string of any size/values, not just the sample string given above. Please use whatever coding language you feel most comfortable with.

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2. Write a function that will provide directions between two locations. For this exercise, you will leverage the Google Directions API to source the navigation information from point A to point B.

   The function should accept three input parameters:

   origin
   destination
   preferred travel method

   The function should output the entire trip time in text format and information on each individual leg of the trip including duration time and duration distance. For each step in the leg, please include duration time, duration distance, and formatted instructions. Ideally the formatted instructions will not include any html tags but this is not necessary. You may assume that the parameters given will be valid according to the API documentation. You may also assume there will be a route from the origin to the destination.

   For information on the Google Directions API, please refer to the following documentation: https://developers.google.com/maps/documentation/directions/intro. Please note that you can reference additional documentation resources for further information regarding the Google Directions API.

   Here is an example:

   origin = Boston, MA
   destination = Santa Clara, CA
   preferred travel method = driving

   These input arguments would go to this URL (use your own API Key):

   https://maps.googleapis.com/maps/api/directions/json?origin=Boston+MA&destination=Santa+Clara+CA&mode=driving&key=YOURAPIKEY

   Below are formatted examples of the first and last steps of the journey.

   Step 1:
   In 0.1 mi, Head north on Cambridge St toward Sudbury St. This should take you 1 min.

   [Steps 2 – 54 are omitted]

   Step 55:
   In 0.1 mi, Turn right onto Lincoln St. This should take you 1 min.

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3. Create class definitions that will properly represent the following constructs:

   Define a *Shape* object, where the object is any two-dimensional figure, and has the following characteristics:

   name (string)

perimeter (integer)
area (integer)

Define a *Circle* object. A *Circle* has the characteristics of a *Shape* object. A *Circle* is a *Shape*.

Define a *Triangle* object. A *Triangle* has the characteristics of a *Shape* object. A *Triangle* is a *Shape*. However, a *Triangle* has the additional characteristic:

sides = [length1, length2, length3] Note that “sides” is an array of integers.

Instantiate an object of each type (Shape, Circle, Triangle).

The following questions should be hidden from the candidate’s view and only visible to the interviewer(s):

4. Ask the candidate to provide an overview of a work, research or personal project on the candidate’s resume or GitHub. This should be a technical discussion aimed at an audience with a general technical background. Tell the candidate to assume you have no prior knowledge about this project.

5. What is your experience with Git? What is Git used for? Talk about how Git can be leveraged to support the agile development process.

6. Do you have any experience with front end development? If so, please elaborate. *You can request the candidate to explain the functions of HTML, CSS and/or JavaScript as an example of elaboration.*