



[doc] Add API server interview question
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README.md	[doc] Add API server interview question	3 weeks ago

README.md

Product Name: Inner Product API

Product description

A service that helps our users calculate inner products.

Development Rules

0. IMPORTANT: *You may ask questions anytime during this exam.*
1. First, you have 10 minutes to read this specs.
2. Second, you'll have up to 10 minutes to estimate how much requirement(s) of the product are you able to finish.
3. Then, you'll have 60 minutes to develop the product, please follow your above estimation, but you are encouraged to finish the whole product.
4. Last, you have 10 minutes to demo the product you build to us.

Guideline

Follow the guideline as possible as you can.

1. Your codebase should be at production level (for you to interpret what this means).
2. Your codebase should be easy to introduce future specs.
3. Your codebase should be easily understandable for other developers.

Product Specs

Priority with a smaller number means it has a higher priority.

Product Spec A: For users

Priority	Requirements
1	An HTTP server that returns a status code of 404 with a blank body no matter what path (end-point) is accessed unless stated below otherwise.
2	A path of http://<your_domain>/innerproduct/ that always returns a status code of 200 when requested with the POST method.
5	The path /innerproduct/ will take JSON data as input with the follow format: { "x": <array>, "y": <array> } where array should have the same length and should contain numbers, the length of the array should be at least 1 and not exceed 50 (1 <= Length <= 50). Example: { "x": [1, 2, 3], "y": [4, 5, 6]}
6	If the input does not meet the above criteria the following JSON message should be returned: { "error": { "type": "format error" } }
7	If the input is correct the path /innerproduct/ should return the inner product of the two vectors x and y with the following format: { "xTy": <number> } . Example: For input { "x": [1, 2, 3], "y": [4, 5, 6] } should return { "xTy": 32 } because 32 = 1 * 4 + 2 * 5 + 3 * 6

Priority	Requirements
8	Our API service should be easily adaptable to other IO devices such as replacing HTTP to command line or even IRC protocol in the future.
9	The <code>/innerproduct/</code> path should be able to handle 500 requests per second, given the above spec.

Product Spec B: For API admins

Priority	Requirements
3	A path of <code>http://<your_domain>/info/</code> that always return a status code of <code>200</code> when requested with the <code>GET</code> method.
4	The above path <code>/info/</code> should return the number of times the path <code>/innerproduct/</code> has been called with the <code>POST</code> method with the following format: <code>{ "number_of_requests": { "innerproduct": <number> } }</code> . Example: <code>{ "number_of_requests": { "innerproduct": 3 } }</code>
10	The <code>/info/</code> path should return within 100ms, but we expect it will have low requests per second.
11	The above path <code>/info/</code> should aadditionally return the number of times the path <code>/innerproduct/</code> has been called with the <code>POST</code> method but resulted with an <code>error</code> with the following format: <code>{ "number_of_requests": { "innerproduct": <number> }, "number_of_errors": { "innerproduct": <number> } }</code> . Example: <code>{ "number_of_requests": { "innerproduct": 3 }, "number_of_errors": { "innerproduct": 1 } }</code>