

Choose the Right Hardware

Proposal Template

Scenario 1: Manufacturing

Client Requirements and Potential Hardware Solution

Look through the scenario and find any relevant client requirements. Then, suggest a potential hardware type and explain how this hardware would satisfy each of the requirements.

Which hardware might be most appropriate for this scenario? (CPU / IGPU / VPU / FPGA)
FPGA

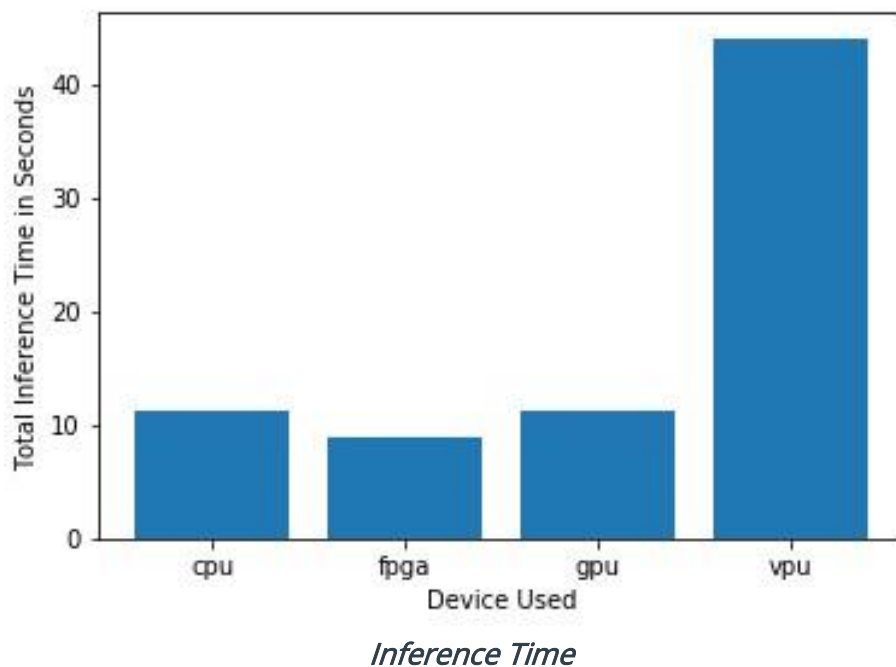
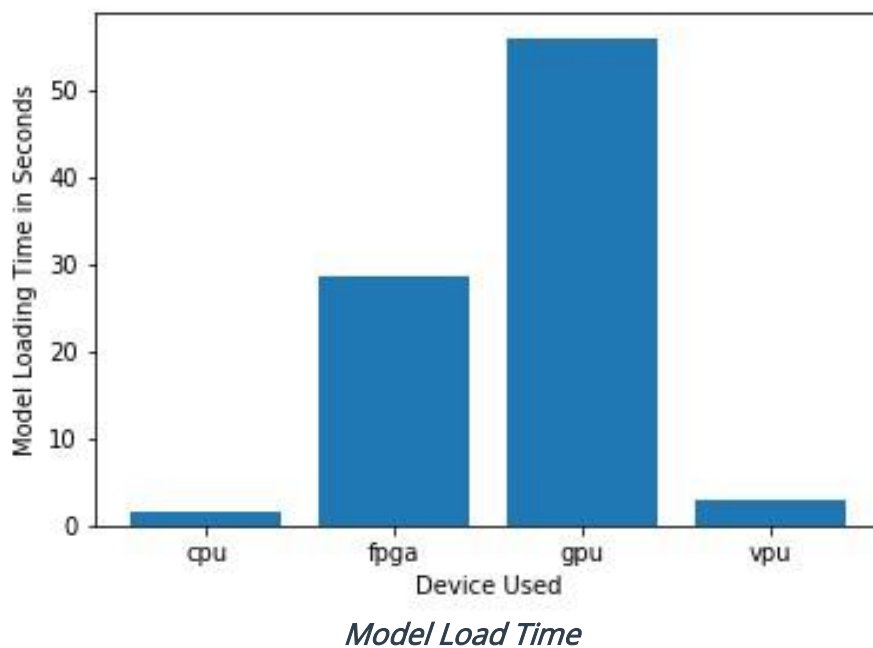
Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
<i>Example requirement:</i> The client requires a tiny device to be connected to their CPU—and their budget is only about \$100 for each device.	<i>Example explanation:</i> VPU or NCS2 is only about 27.40 mm in size and would fit in the price range.
<i>The client has two tasks.</i> 1) Count the number of people in the factory line 2) Detect chip flaws <i>He also needs a system that is fast, flexible and reprogrammable.</i>	<i>FPGA are very fast, flexible and reprogrammable.</i>
<i>Money is not the problem.</i>	<i>FPGAs are more expensive than other options, but better for the customer scenario</i>
<i>The system should last at least 5-10 years</i>	<i>FPGAs have a long lifespan.</i>

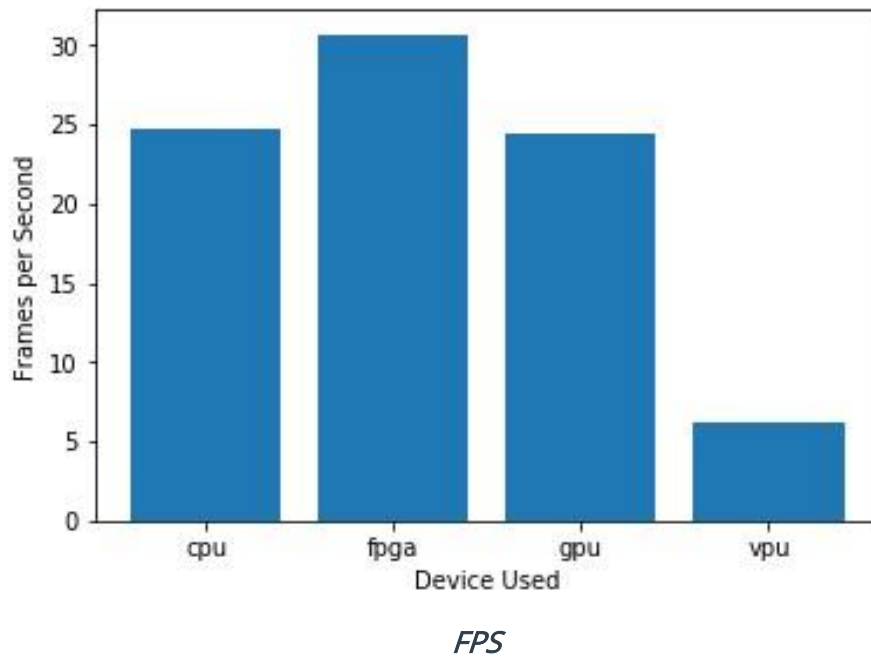
Queue Monitoring Requirements

Maximum number of people in the queue	<i>The customer wants to monitor the total number of people on the factory line.</i>
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Test Results

After you've tested your application on all four hardware types (CPU, IGPU, VPU, and FPGA), copy the matplotlib output showing the comparison into the spaces below. You should have three graphs (for model load time, inference time, and FPS).





Final Hardware Recommendation

Now synthesize your points from above and provide a brief write-up describing why the chosen hardware is the best choice for this scenario. Be sure to discuss the client's requirements, the test results, and how these relate to one another (e.g., perhaps one of the devices performed better than the rest, but does not meet one of the client's requirements).

Write-up: Final Hardware Recommendation

The FPGA is the perfect choice. It is faster than all other variants and has low inference times. In addition, the FPGA has the longest lifespan and can easily be used for other tasks depending on customer requirements. The desired FPS is also achieved in contrast to the other variants. The customer also has no budget problem.

Scenario 2: Retail

Client Requirements and Potential Hardware Solution

Look through the scenario and find any relevant client requirements. Then, suggest a potential hardware type and explain how this hardware would satisfy each of the requirements.

Which hardware might be most appropriate for this scenario? (CPU / IGPU / VPU / FPGA)
<i>CPU</i>

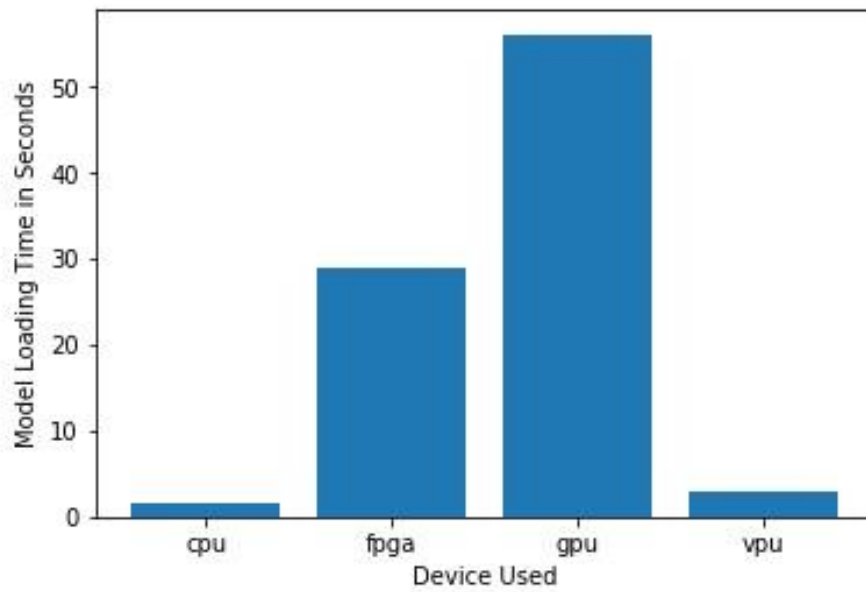
Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
<i>Example requirement:</i> The client requires a tiny device to be connected to their CPU—and their budget is only about \$100 for each device.	<i>Example explanation:</i> VPU or NCS2 is only about 27.40 mm in size and would fit in the price range.
<i>The customer has no money for more equipment.</i>	<i>CPU Intel i7 already exists and is not fully occupied</i>
<i>The task does not require high speed inference</i>	<i>A maximum of 5 people are employed at the checkout.</i>
<i>[TODO: Type your answer here]</i>	<i>[TODO: Type your answer here]</i>

Queue Monitoring Requirements

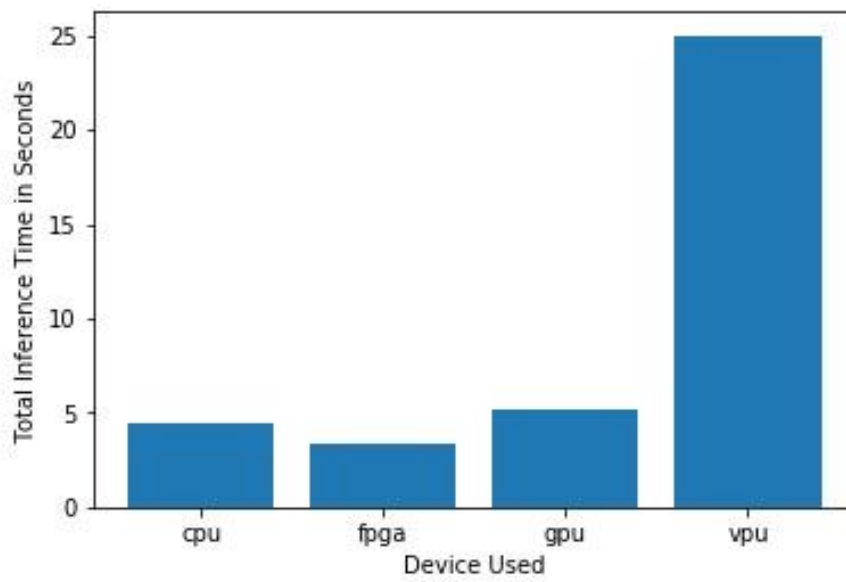
Maximum number of people in the queue	<i>Should be 2 because the profit decreases when there are more people in the queue.</i>
Model precision chosen (FP32, FP16, or Int8)	<i>FP32 (CPU best fit)</i>

Test Results

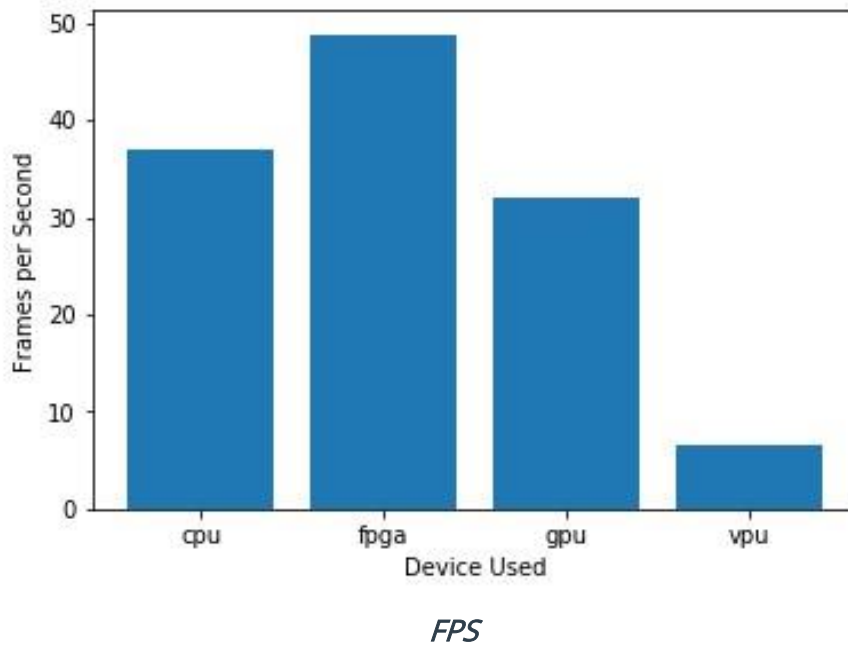
After you've tested your application on all four hardware types (CPU, IGPU, VPU, and FPGA), copy the matplotlib output showing the comparison into the spaces below. You should have three graphs (for model load time, inference time, and FPS).



Model Load Time



Inference Time



Final Hardware Recommendation

Now synthesize your points from above and provide a brief write-up describing why the chosen hardware is the best choice for this scenario. Be sure to discuss the client's requirements, the test results, and how these relate to one another (e.g., perhaps one of the devices performed better than the rest, but does not meet one of the client's requirements).

Write-up: Final Hardware Recommendation

*The CPU is the right decision. The inference time is only slightly worse than with the FPGA. The client has no additional money and the CPU is not fully occupied.
The performance is sufficient for the requirements.*

Scenario 3: Transportation

Client Requirements and Potential Hardware Solution

Look through the scenario and find any relevant client requirements. Then, suggest a potential hardware type and explain how this hardware would satisfy each of the requirements.

Which hardware might be most appropriate for this scenario?

(CPU / IGPU / VPU / FPGA)
VPU

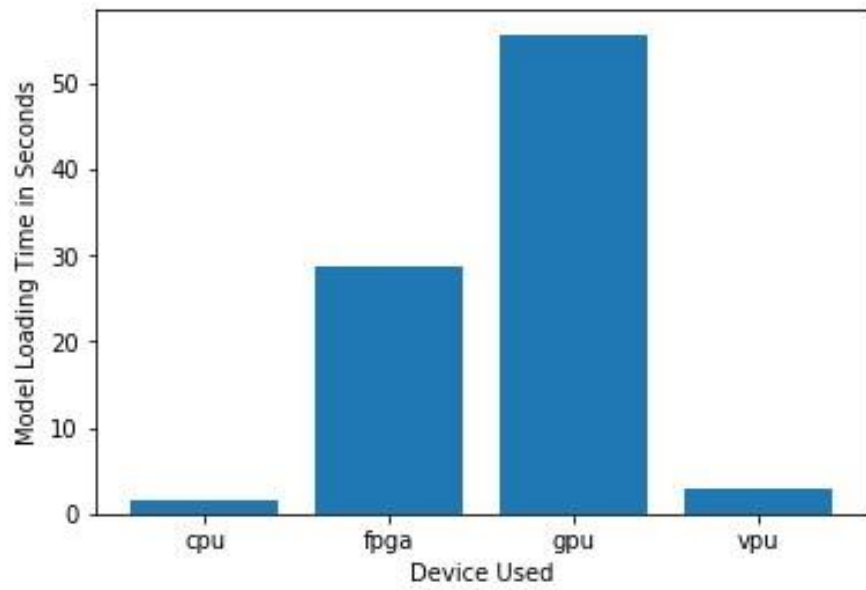
Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
<i>Example requirement:</i> The client requires a tiny device to be connected to their CPU—and their budget is only about \$100 for each device.	<i>Example explanation:</i> VPU or NCS2 is only about 27.40 mm in size and would fit in the price range.
<i>The main problem is the low budget. 300\$ per machine.</i>	<i>So the possibilities would be CPU and VPU</i>
<i>However, no additional computing power is available.</i>	<i>The VPU is therefore the only choice.</i>
<i>The job does not need a top speed.</i>	<i>The VPU fits perfectly..</i>

Queue Monitoring Requirements

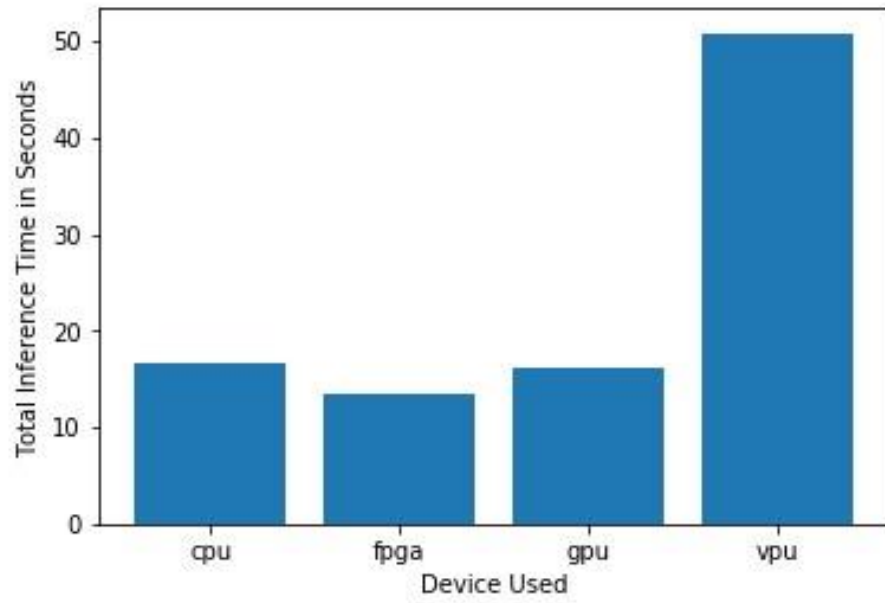
Maximum number of people in the queue	15
Model precision chosen (FP32, FP16, or Int8)	FP 16 (VPU)

Test Results

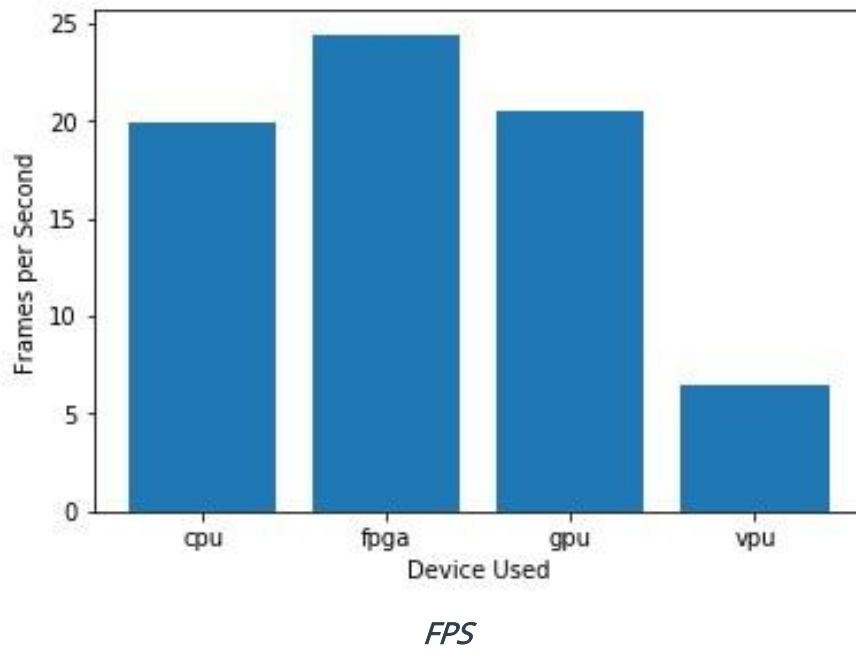
After you've tested your application on all four hardware types (CPU, IGPU, VPU, and FPGA), copy the matplotlib output showing the comparison into the spaces below. You should have three graphs (for model load time, inference time, and FPS).



Model Load Time



Inference Time



Final Hardware Recommendation

Now synthesize your points from above and provide a brief write-up describing why the chosen hardware is the best choice for this scenario. Be sure to discuss the client's requirements, the test results, and how these relate to one another (e.g., perhaps one of the devices performed better than the rest, but does not meet one of the client's requirements).

Write-up: Final Hardware Recommendation

The VPU is the only choice. It meets the requirements and is particularly inexpensive.