

Choose the Right Hardware

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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

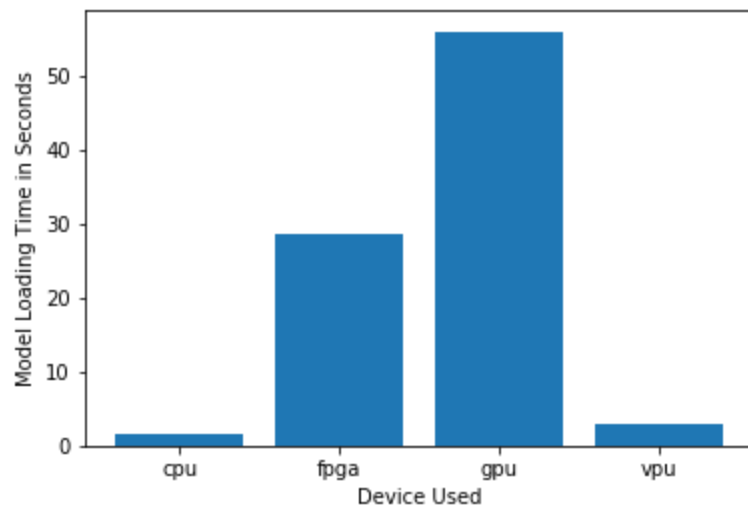
Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
<i>Example requirement:</i> The client requires a tiny device to be connected to their CPU—and their budget is only about \$100 for each device.	<i>Example explanation:</i> VPU or NCS2 is only about 27.40 mm in size and would fit in the price range.
<i>The client requires the device that is programmable and able to handle different tasks.</i>	<i>FPGA is flexible and programmable for this project</i>
<i>The client requires the device to run inference on the video stream very quickly</i>	<i>FPGA got the fastest speed and able to run 24/7</i>
<i>The client requires the device to run 5- 10 years</i>	<i>FPGA is designed to run for a longer time</i>

Queue Monitoring Requirements

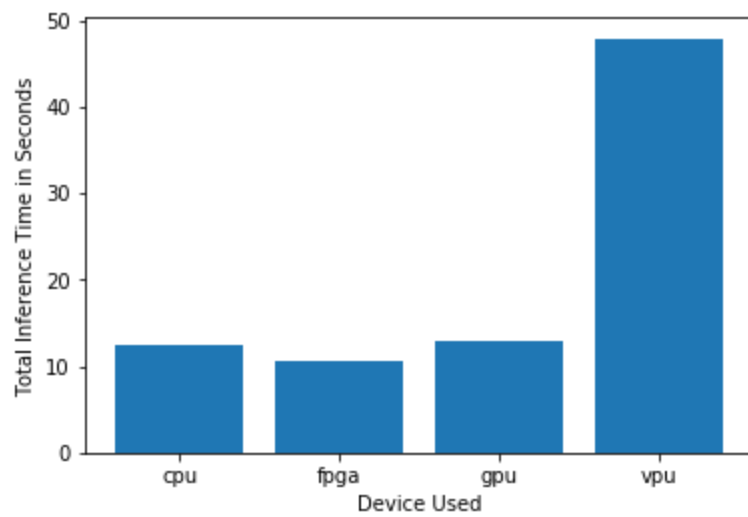
Maximum number of people in the queue	2
Model precision chosen (FP32, FP16, or Int8)	FP16

Test Results

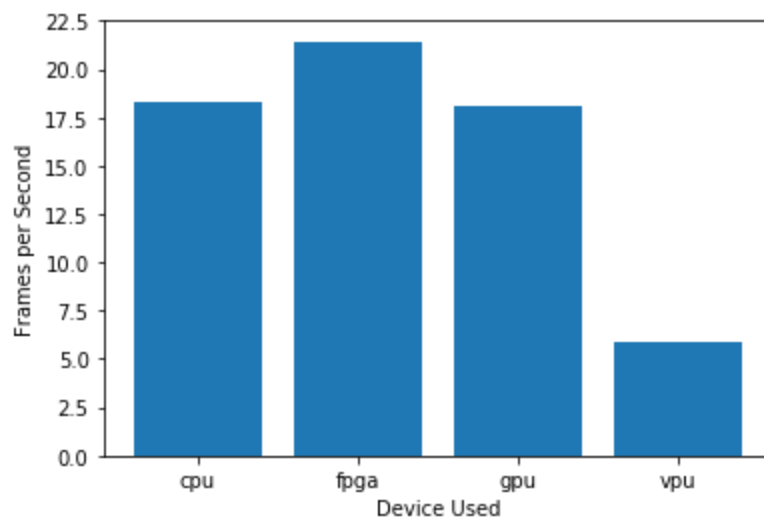
After you've tested your application on all four hardware types (CPU, IGPU, VPU, and FPGA), copy the matplotlib output showing the comparison into the spaces below. You should have three graphs (for model load time, inference time, and FPS).



Model Load Time



Inference Time



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
<i>FPGA will be my final decision, because it meets all of the client's requirements.</i> <ul style="list-style-type: none">• <i>Flexibility, programmable</i>• <i>Run inference on the video stream very quickly</i>• <i>Reliable in a long run</i>

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>

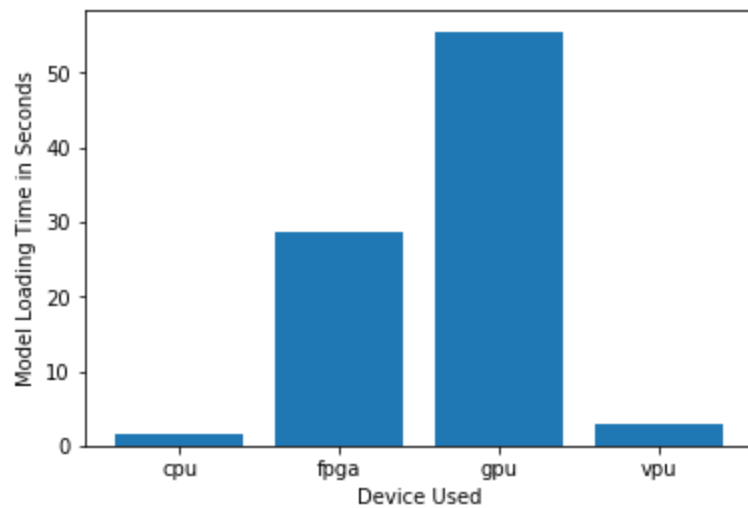
Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
<i>Example requirement:</i> The client requires a tiny device to be connected to their CPU—and their budget is only about \$100 for each device.	<i>Example explanation:</i> VPU or NCS2 is only about 27.40 mm in size and would fit in the price range.
<i>The client already has an Intel i7 core processor computer</i>	<i>We can use it's CPU</i>
<i>The client doesn't have the budget</i>	<i>We can not buying new chips and using his current computer</i>
<i>The client wants to save electricity</i>	<i>We can use almost the same power by using his current computer</i>

Queue Monitoring Requirements

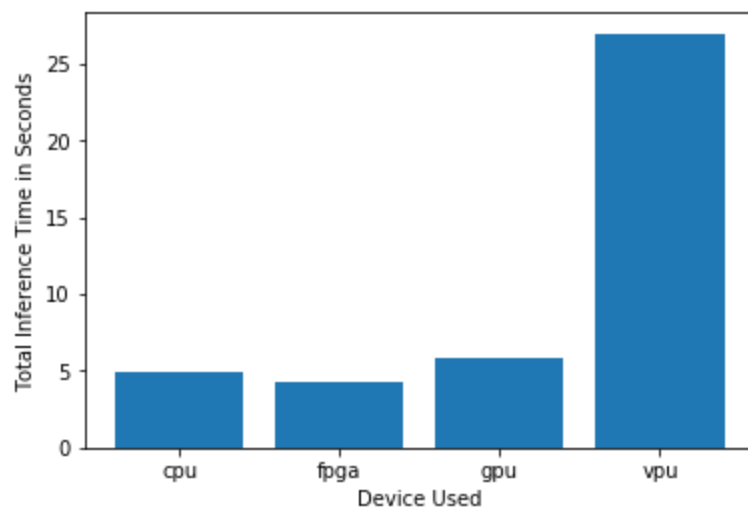
Maximum number of people in the queue	5
Model precision chosen (FP32, FP16, or Int8)	FP32

Test Results

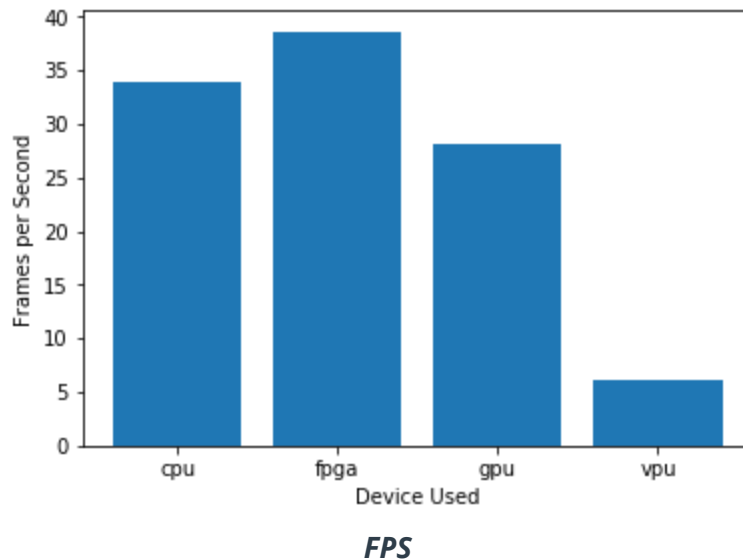
After you've tested your application on all four hardware types (CPU, IGPU, VPU, and FPGA), copy the matplotlib output showing the comparison into the spaces below. You should have three graphs (for model load time, inference time, and FPS).



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

CPU will be my final decision, because it meets all of the client's requirements.

- Minimum cost (No extra hardware cost)
- Minimum electricity consumption (No extra hardware)

I once thought of GPU, but it turns out its performance is even worse than CPU itself, so I stick with CPU as my final decision.

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(NCS2)

Requirement Observed

How does the chosen hardware meet this

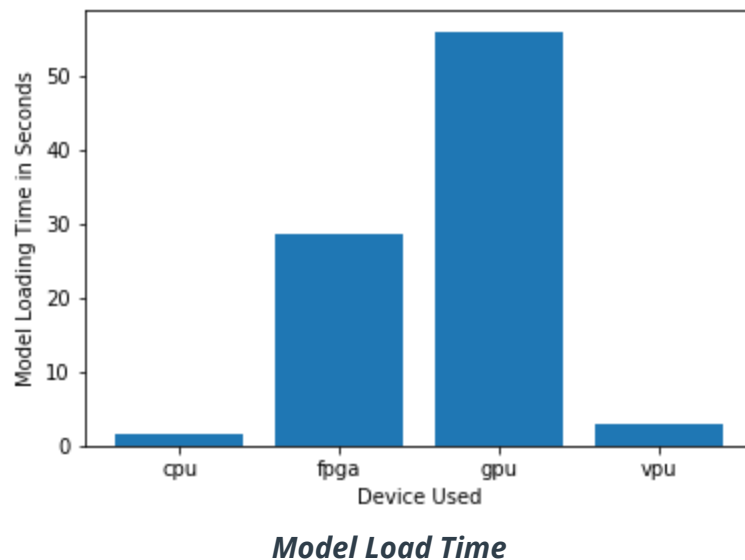
(Include at least two.)	requirement?
<i>Example requirement:</i> The client requires a tiny device to be connected to their CPU—and their budget is only about \$100 for each device.	<i>Example explanation:</i> VPU or NCS2 is only about 27.40 mm in size and would fit in the price range.
<i>The client's budget is around 300 per machine</i>	<i>VPU or NCS2 would fit in the price range.</i>
<i>The client needs new hardware as current computer is already in used</i>	<i>Building a computer might work, but it cost more than 300. So we might use VPU with his current computer.</i>
<i>The client wants to save on electricity</i>	<i>VPU can minimize the extra electricity consumption.</i>

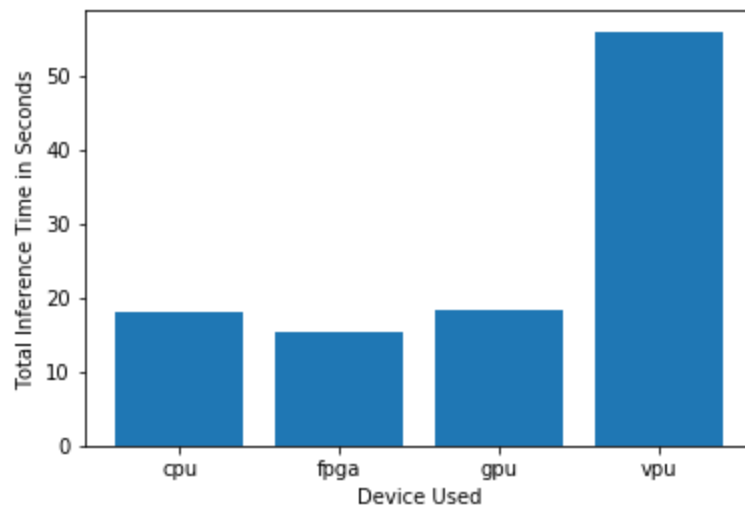
Queue Monitoring Requirements

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

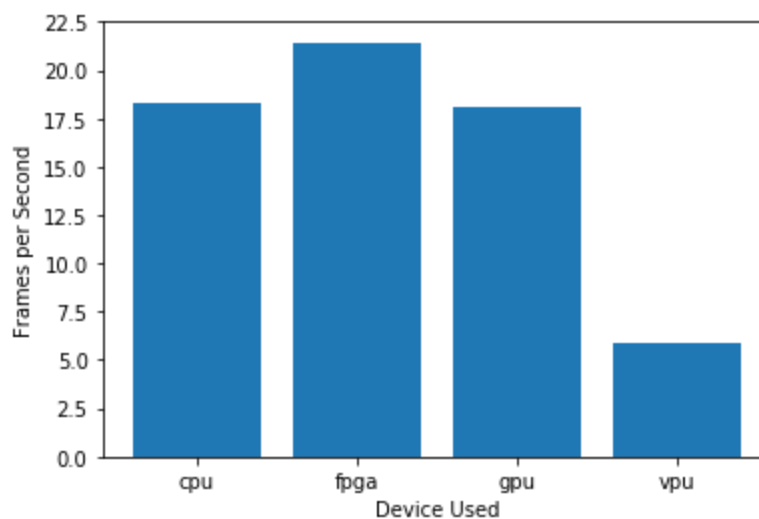
Test Results

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).





Inference Time



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

VPU or NCS2 will be my final decision, because it meets all of the client's requirements.

- *Limited budget*
- *Current computer can't provide much processing power*
- *Minimize electricity consumption*

Even there are better choice with this client, but the limited budget really makes us no choice.

