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

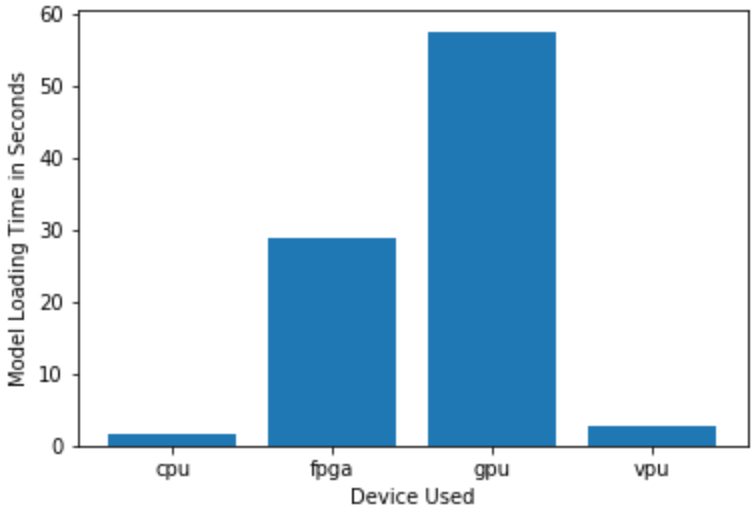
Requirement Observed (Include at least two.)	**How does the chosen hardware meet this requirement?**
Example requirement: The client requires a tiny device to be connected to their CPU—and their budget is only about $100 for each device.	*Example explanation:* VPU or NCS2 is only about 27.40 mm in size and would fit in the price range.
The client needs a powerful device to run inference on the video stream very quickly.	FPGA meets this user requirement as it is an high performance and low latency device.
The client requires flexible device so that it can be reprogrammed and optimized to quickly detect flaws. He has also enough revenue to install a quality system with a long lifespan.	FPGA seems an appropriate device as it covers most of this client requirement : flexibility, reprogrammability and long lifespan.
[TODO: Type your answer here]	*[TODO: Type your answer here]*

Queue Monitoring Requirements

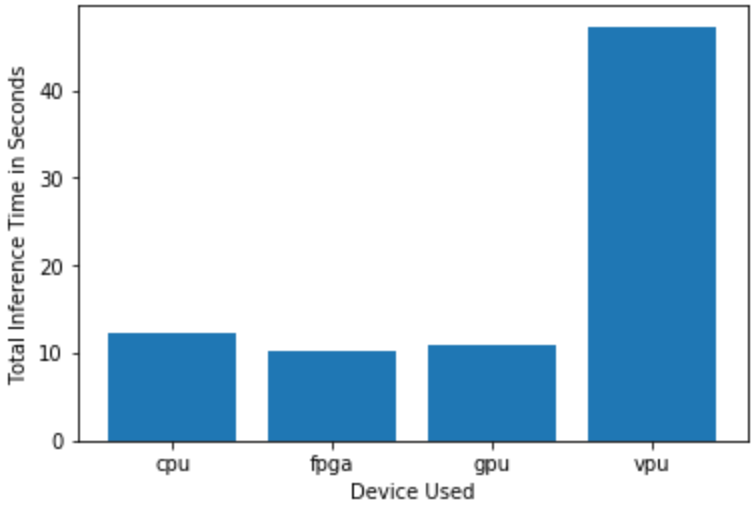
Maximum number of people in the queue	2
Model precision chosen (FP32, FP16, or Int8)	FP16

Test Results

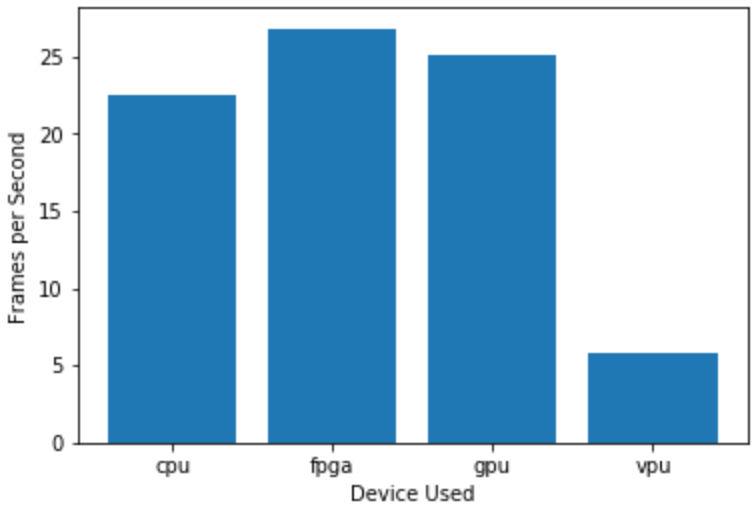
After you've tested your application on all four hardware types (CPU, IGPU, VPU, and FPGA), copy the matplotlib output showing the comparison into the spaces below. You should have three graphs (for model load time, inference time, and FPS).



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
Although the CPU performed better for model loading time, FPGA is the best devices I would recommend for this scenario as it has the best results in terms of Inference Time and FPS that almost fit the client requirements. And more, FPGA is the flexible and programmable device exactly in accordance with the flexibility constraints expressed by the client.

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)
CPU/IGPU, VPU

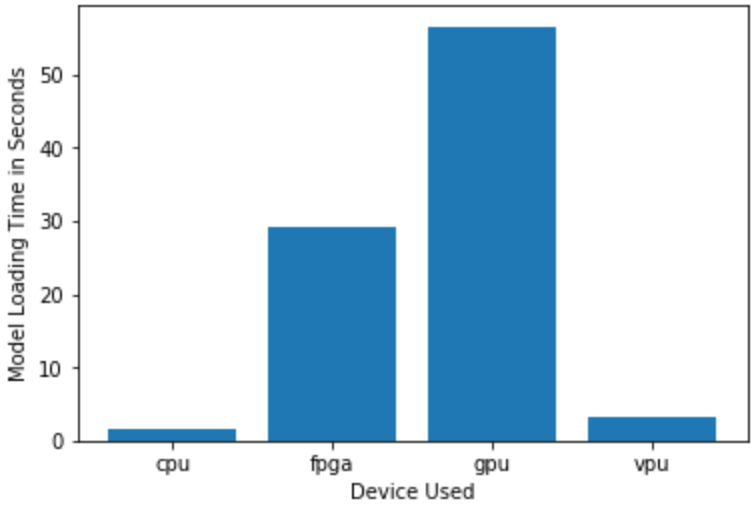
Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
The client needs a device to process large number of frames especially during rush hours.	The preexisting i7 core CPU/IGPU can meet this requirement
The client wants to save his electric bill as much as possible.	VPU or NCS2 is a low power-cost device that best fits this power requirement.
The client has not much money to invest in additional hardware.	VPU or NCS2 is a good trade-off for this constraint.
The client would want to use the preexisting hardware	The performance of the available CPUs with their IGPUs can be well exploited to meet this client's need.

Queue Monitoring Requirements

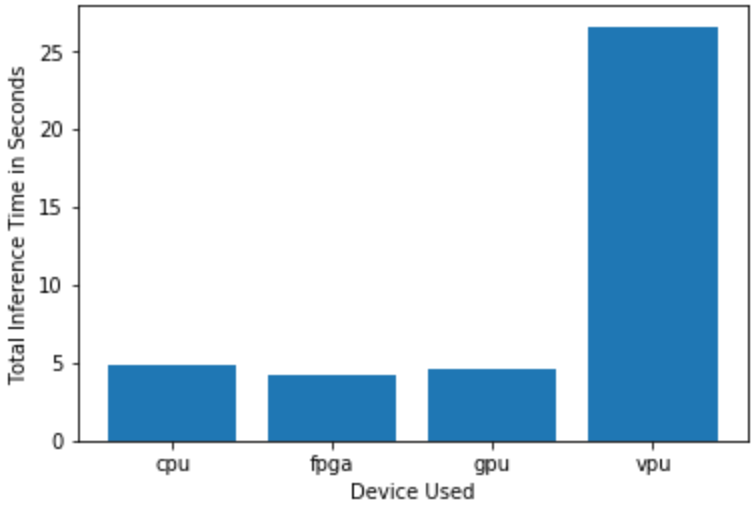
Maximum number of people in the queue	5
Model precision chosen (FP32, FP16, or Int8)	FP32, FP16

Test Results

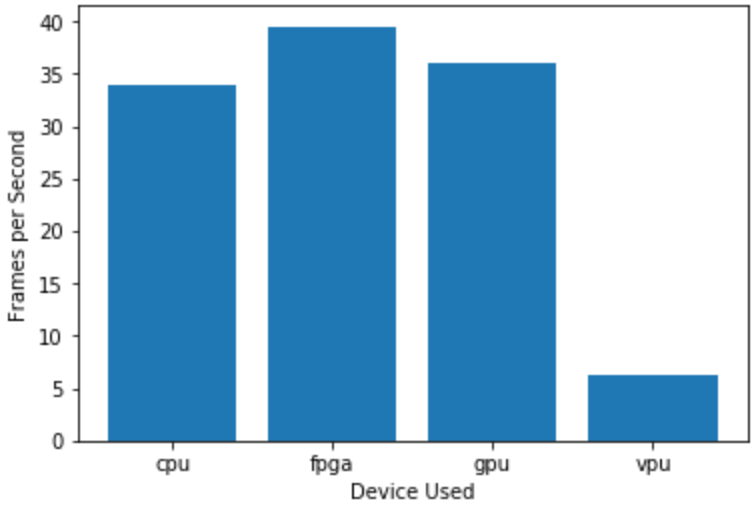
After you've tested your application on all four hardware types (CPU, IGPU, VPU, and FPGA), copy the matplotlib output showing the comparison into the spaces below. You should have three graphs (for model load time, inference time, and FPS).



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
Based on the above results, I would definitely recommend the client to get profit of the pre-existing i7 core CPU with its IGPU for loading model and frame preprocessing tasks. But to satisfy the electric bill constraint, the client can buy an additional VPU which is a low-cost device on which inference can be run though with a low inference time compared to other devices, but still acceptable for this scenario.

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 or NCS2

Requirement Observed (Include at least two.)	**How does the chosen hardware meet this requirement?**

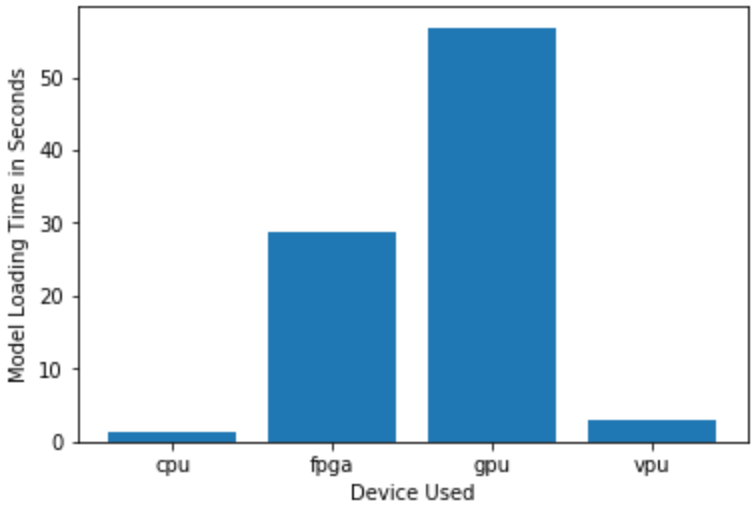
Example requirement: The client requires a tiny device to be connected to their CPU—and their budget is only about $100 for each device.	*Example explanation:* VPU or NCS2 is only about 27.40 mm in size and would fit in the price range.
The client needs a real-time and fast monitor system.	VPU or NCS2 is the best additional processing device that can accelerate the performance of the available CPUs
The client wants to save money and future power consumption -thus their budget is limited to $300 per machine.	VPU or NCS2 is low-power and low-cost device that best fits these client's constraints.
[TODO: Type your answer here]	*[TODO: Type your answer here]*

Queue Monitoring Requirements

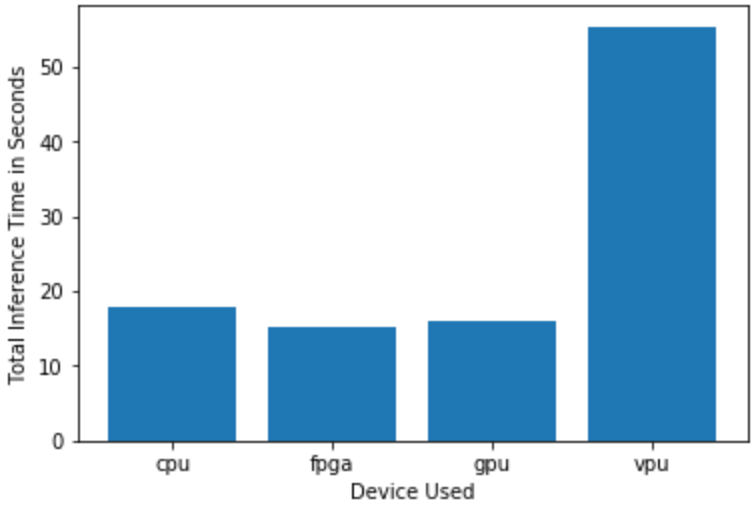
Maximum number of people in the queue	15
Model precision chosen (FP32, FP16, or Int8)	FP16

Test Results

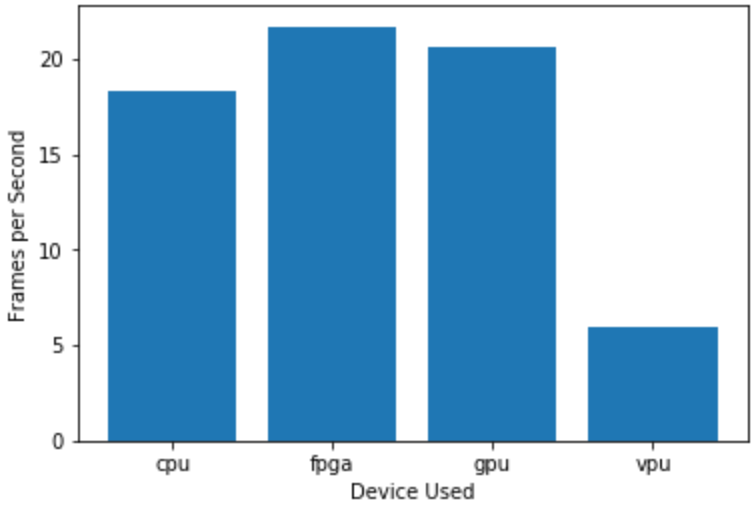
After you've tested your application on all four hardware types (CPU, IGPU, VPU, and FPGA), copy the matplotlib output showing the comparison into the spaces below. You should have three graphs (for model load time, inference time, and FPS).



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
For this scenario, VPU or NCS2 is the appropriate device for boosting the processing power of the preexisting hardwares. Though it's bad performance inference time results, in comparison to other devices, it best fits the client’s budget constraint.