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.

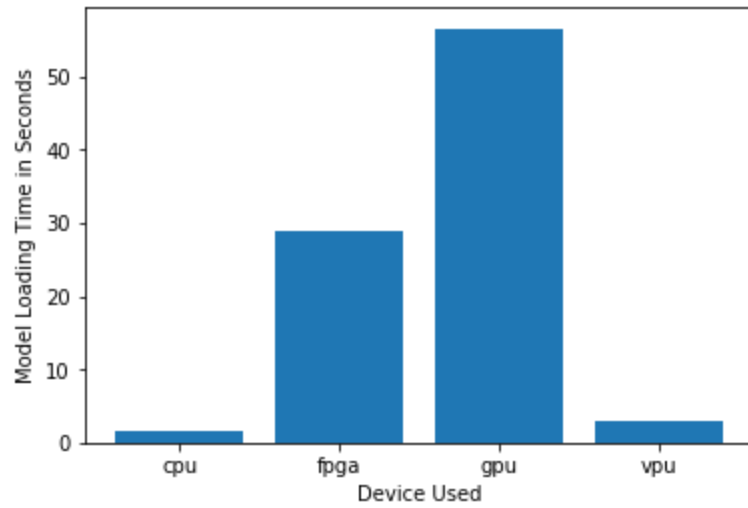| Which hardware might be most appropriate for this scenario? (CPU / IGPU / VPU / FPGA) |
| --- |
| *FPGA* |

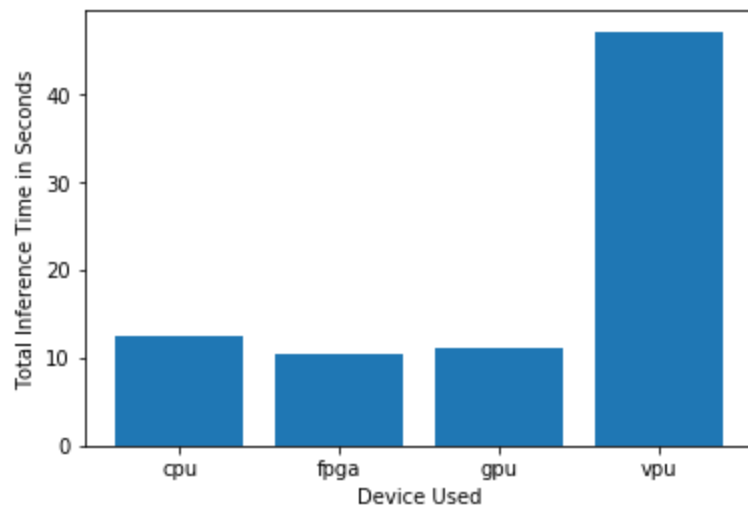| Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
Example requirement: The client requires a tiny device to be connected to their CPU—and their budget is only about $100 for each device.	*Example explanation:* VPU or NCS2 is only about 27.40 mm in size and would fit in the price range.
The client wants the system to be reprogrammed and optimized to quickly detect flaws in different chip designs.	*FPGA is designed with max. flexibility which can be reprogrammed*
The client wants the system to last for at least 5-10 years and the workers alternate shifts to keep the floor running 24 hours a day	*FPGA is robust which can work 24/7*
The client has plenty of revenue to install a quality system	*FPGA is expensive*

Queue Monitoring Requirements

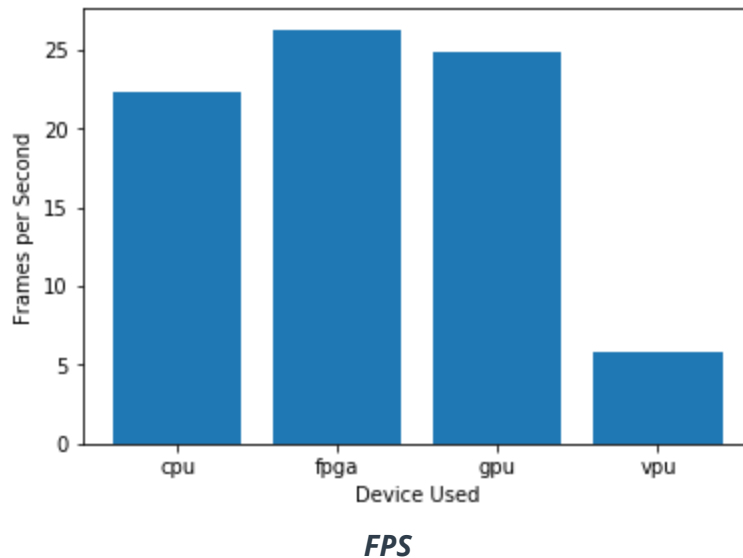|	
Maximum number of people in the queue	*5*
Model precision chosen (FP32, FP16, or Int8)	*FP16*

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
FPGA *because it has the highest FPS and the lowest Inference Time . Although it has a high loading time compared with CPU, it meets the client* requirements which can run 24/7, can be reprogrammed

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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

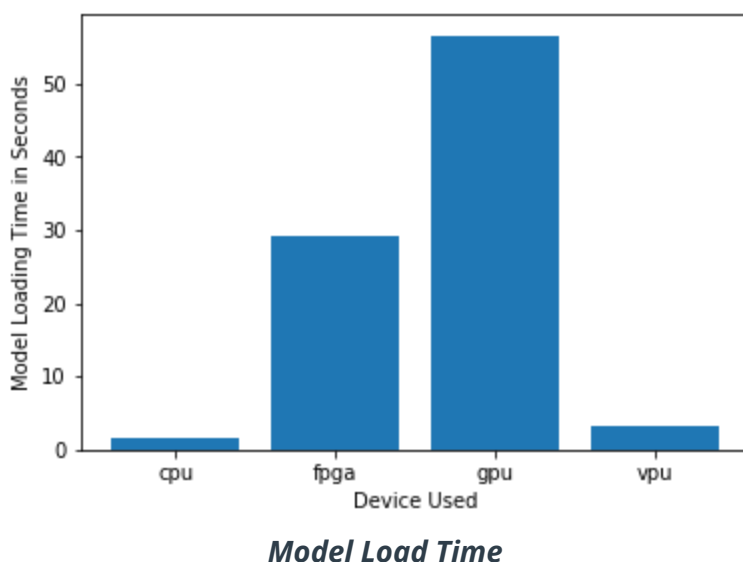| Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
Example requirement:	*Example explanation:*

UDACITY

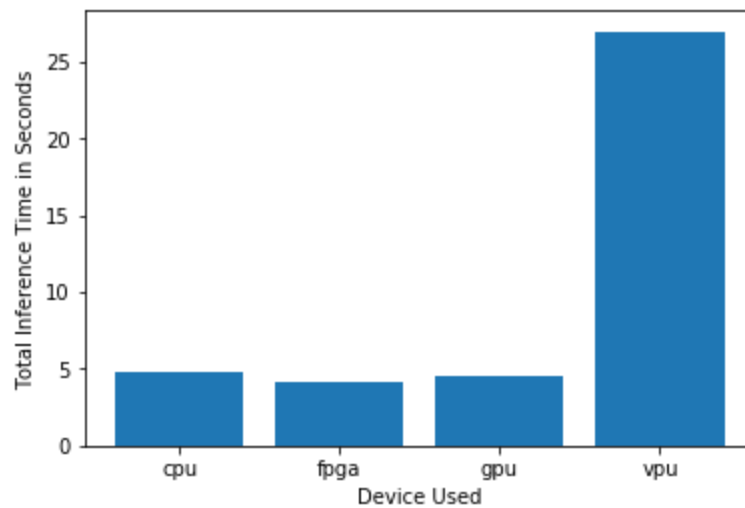|	
The client requires a tiny device to be connected to their CPU—and their budget is only about $100 for each device.	VPU or NCS2 is only about 27.40 mm in size and would fit in the price range.
The client has modern computers with intel I7 that are only used to carry out some minimal task	*Owned CPU is a multiple cores which enable the cpu to do multiprocessing*
The client requires a low power consumption	*CPU has a low power consumption*
The client does not have much money to invest in additional hardware	*The client already has* modern computers with intel i7

Queue Monitoring Requirements

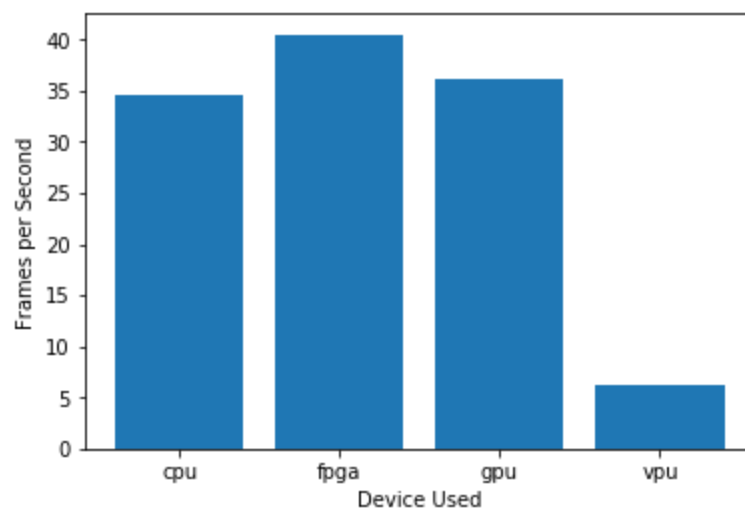|	
Maximum number of people in the queue	*5*
Model precision chosen (FP32, FP16, or Int8)	*FP32*

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

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
CPU. *Although the FPGA can do better than the CPU as it has the lowest inference time and the highest FPS, it is very expensive and doesn't meet the client's* requirements. CPU meets the *client's* requirements as the client already has modern computers with Intel I7 and it has low power consumption.

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.

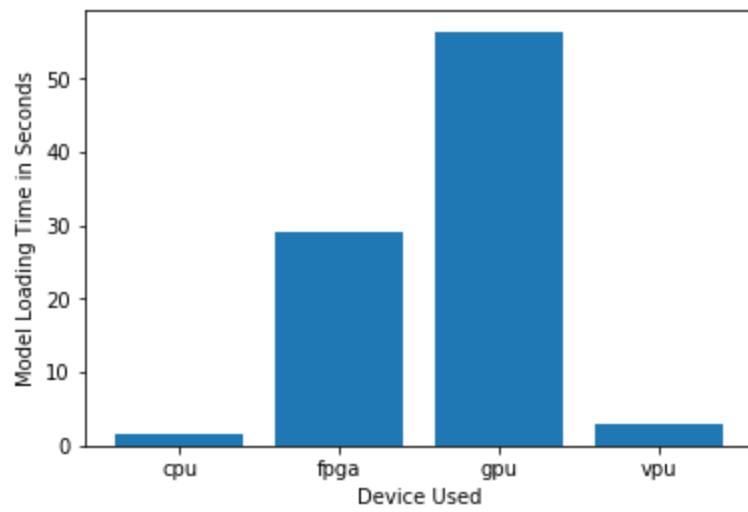| Which hardware might be most appropriate for this scenario? (CPU / IGPU / VPU / FPGA) |
| --- |
| *VPU* |

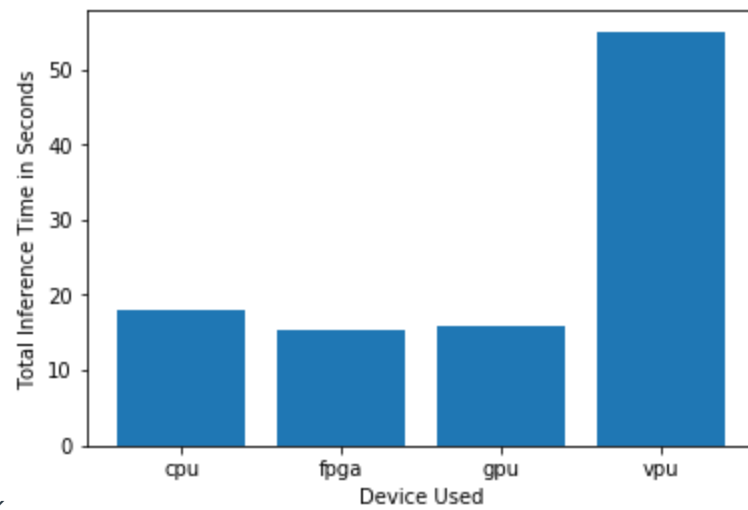| Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
Example requirement: The client requires a tiny device to be connected to their CPU—and their budget is only about $100 for each device.	*Example explanation:* VPU or NCS2 is only about 27.40 mm in size and would fit in the price range.
The client would like to save as much as possible both on hardware and future power requirements.	*VPU is a low-cost/low-power consumption device*
The CPUs in machines has no significant additional processing power to run inference	*VPU accelerates the performance of a pre-existing system*
The client has All-In-One PCs	*VPU can be interfaced with CPUs to perform interface*

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).
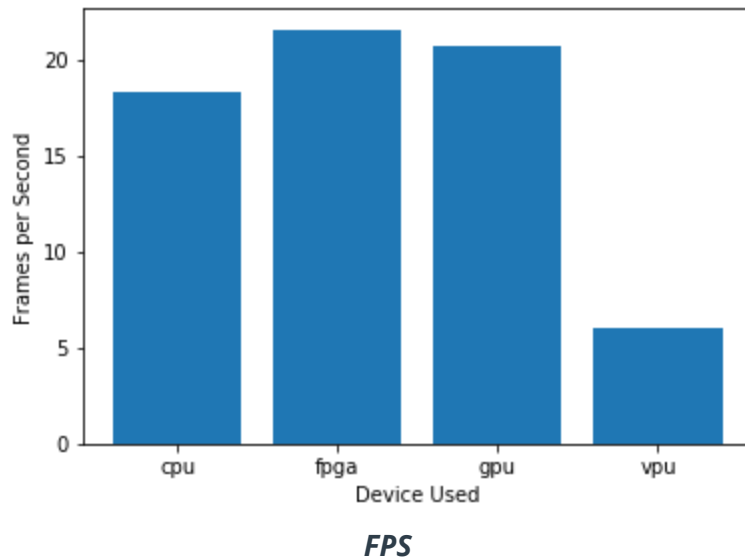
Model Load Time

Inference Time

UDACITY

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. Although CPU can do better but it can't be upgraded as the client has all-in-on pc.FPGA has the highest FPS and lowest inference time but it's expensive and over the budget. VPU meets the client's requirements as it is low-cost device, low power device and can accelerate the performance to perform inference