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

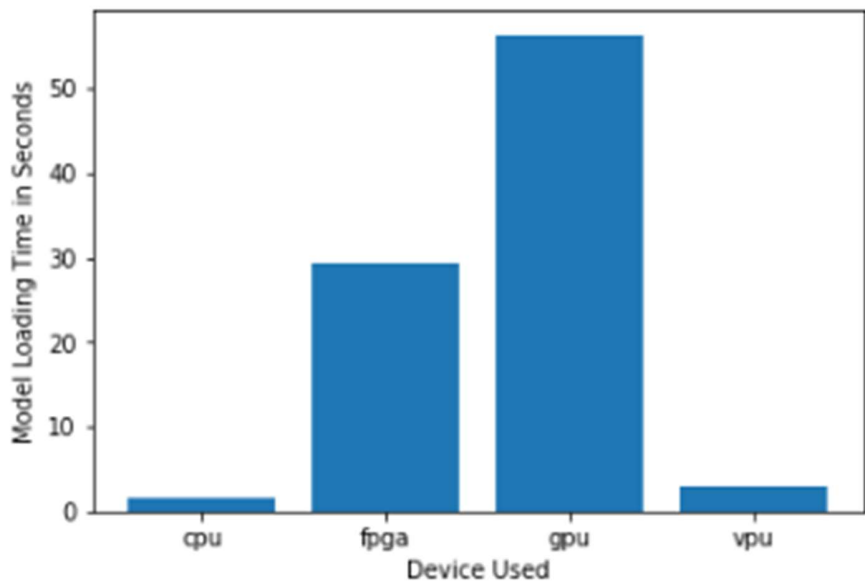| Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
Image processing task to be completed five times per second.	*They're capable to perform inference at much faster rate and giving more than enough required frame processing.*
Significant percentage of the semiconductor chips being packaged for shipping have flaws.	*The high performance comes from the ability to run many sections of the FPGA in parallel and can support hardware acceleration.*
Workers alternate shifts to keep the floor running 24 hours a day so that packaging continues nonstop.	*FPGAs are designed to have 100% on-time performance, meaning they can be continuously running 24 hours a day, 7 days a week, 365 days a year. They are also able to function over a wide range of temperatures, from 0° C to 60° C.*
Would ideally like it to last for at least 5-10 years.	*FPGAs have a long lifespan. For example, FPGAs that use devices from Intel's Internet of Things Group have a guaranteed availability of 10 years, from start of production.*

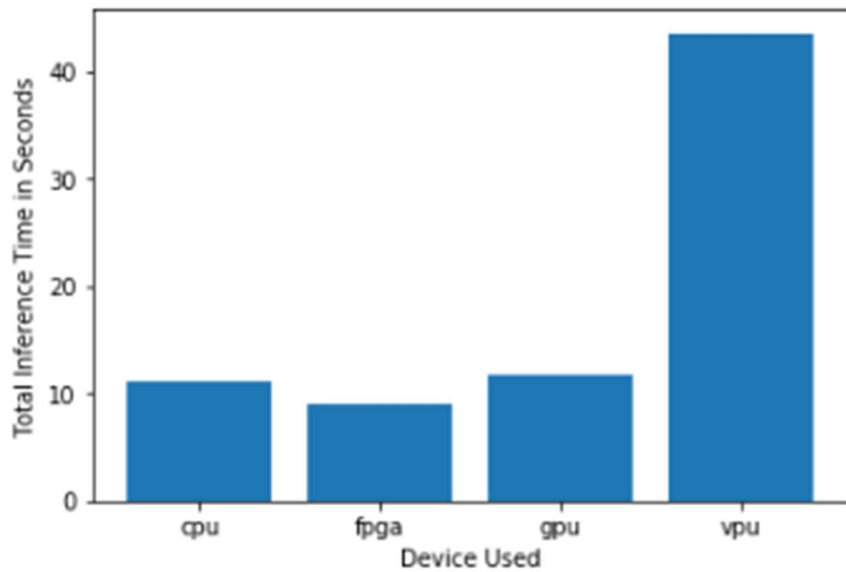| System would also need to be flexible so that it can be reprogrammed and optimized to quickly detect flaws in different chip designs.	*They are field-programmable; they can be reprogrammed to adapt to new, evolving, and custom networks.*

Queue Monitoring Requirements

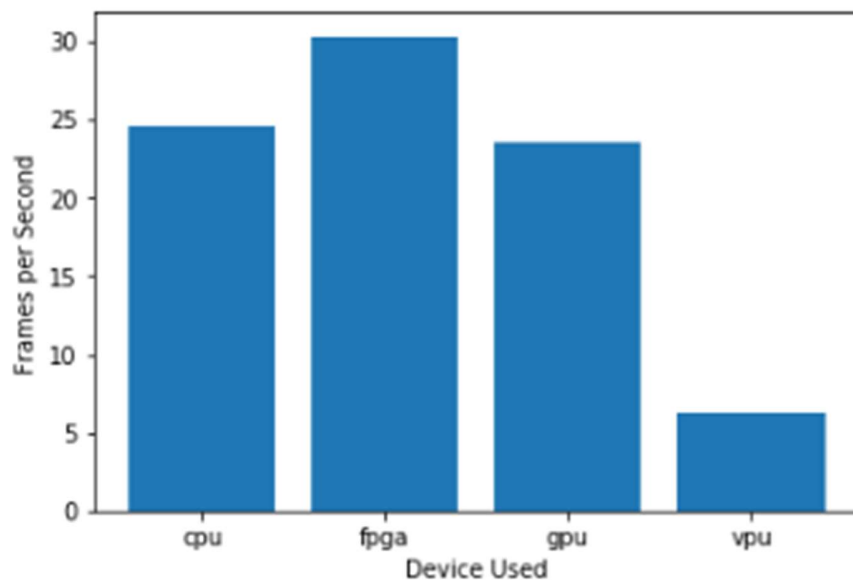| Maximum number of people in the queue	*2*
Model precision chosen (FP32, FP16, or Int8)	*FP16*

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
From above performance graph as we can see that FPGA's have the least inference time and the requirement was same and did a commendable performance. It also has highest FPS. So, it can be a perfect suggestion from our side to go with FPGA. And the ability of FPGA to be reprogrammed makes this device fully recommendable for Mr. Vishwas.

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.

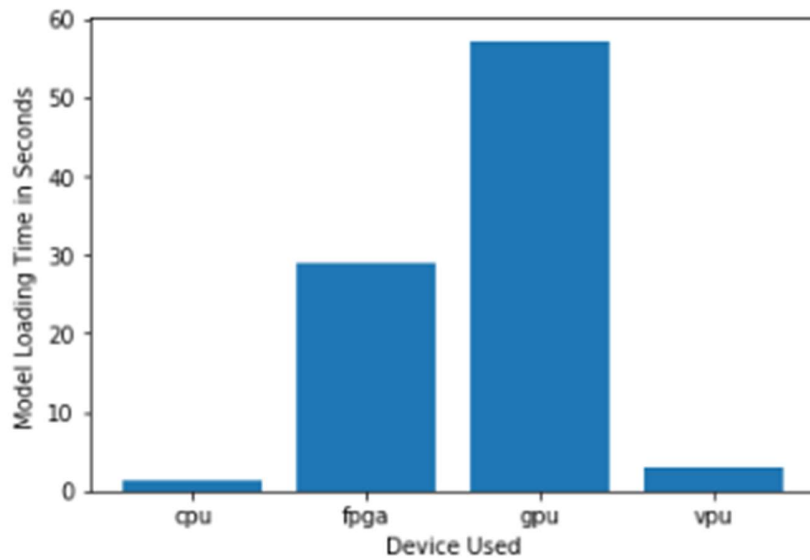| Which hardware might be most appropriate for this scenario? (CPU / IGPU / VPU / FPGA) |
|---|
| *IGPU* |

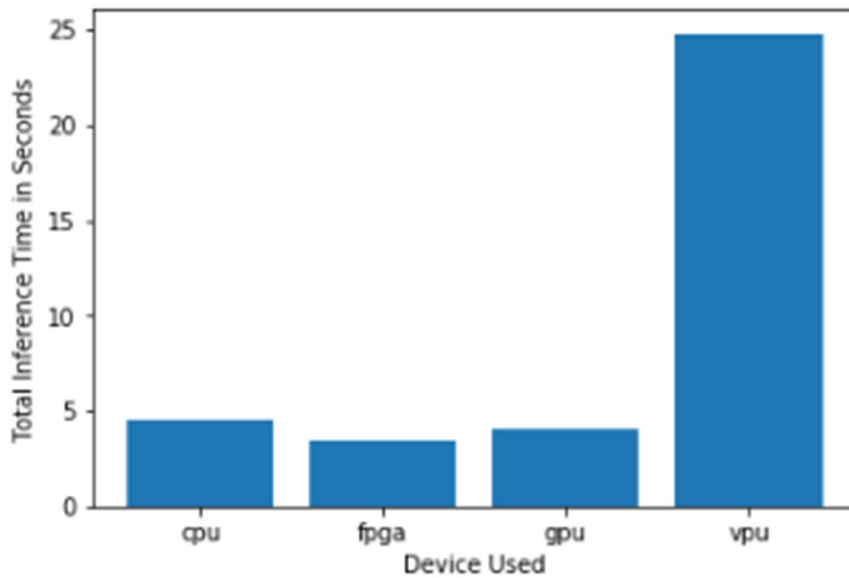| Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
Does not have much money to invest in additional hardware.	*Most of the store's checkout counters already have a modern computer, each of which has an Intel i7 core processor and as these processors are only used to carry out some minimal tasks that are not computationally expensive so we can use that processor and inbuilt IGPU (as i7 processor comes with inbuilt IGPU).*
Save as much as possible on his electric bill	*No extra power usage.*

Queue Monitoring Requirements

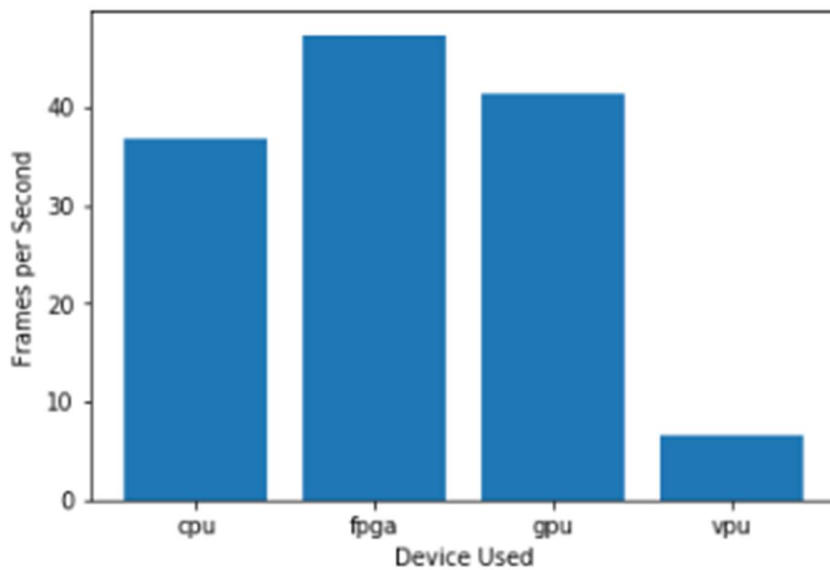|	
Maximum number of people in the queue	*5*
Model precision chosen (FP32, FP16, or Int8)	*FP16*

Test Results

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Final Hardware Recommendation

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Write-up: Final Hardware Recommendation
As her requirement was, no extra H/W installation and no extra power usage so, IGPU was the best as a solution which already comes integrated inside i7 processor and saves her costs too.

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.

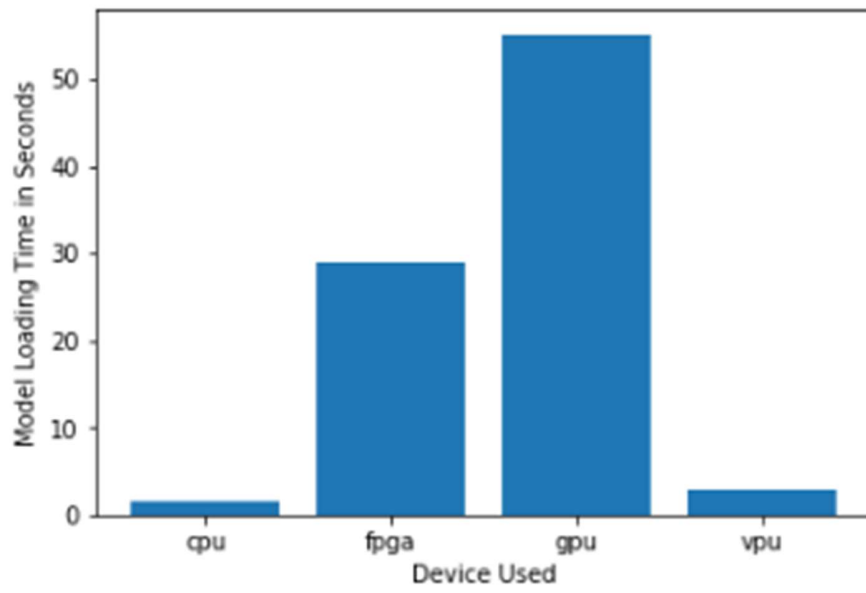| Which hardware might be most appropriate for this scenario? (CPU / IGPU / VPU / FPGA) |
| --- |

[TODO: Type your answer here]

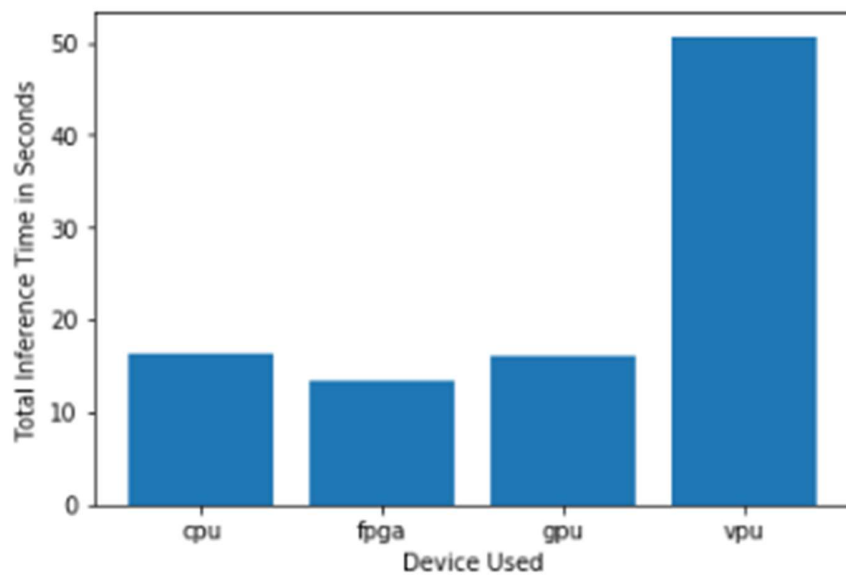| Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
Cost constraint (300$/device)	*VPU or NCS2 is only about 27.40 mm in size and would fit in the price range (Costs 100$).*
Save as much as possible both on hardware and future power requirements	*VPUs are small, low-cost, low-power devices that can dramatically improve the performance of a system without the need to upgrade the other hardware. VPU is an accelerator, meaning it accelerates the performance of the pre-existing CPU. The CPU doesn't need to be a powerful one.*

Queue Monitoring Requirements

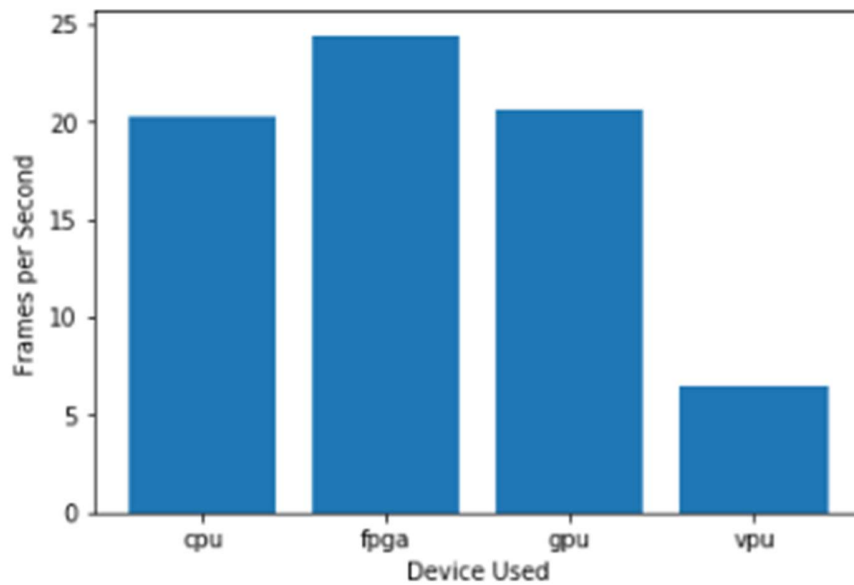| Maximum number of people in the queue	*5*
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Test Results

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Final Hardware Recommendation

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Write-up: Final Hardware Recommendation
FPGA seems to be a better choice but due to cost constraint we can either way go with VPU.