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?
They would like the quality system to last from 5 to 10 years .	FPGA has a long lifespan and guaranteed availability of 10 years.
New designs are created regularly and flexibility is required so that it can be reprogrammed and optimized to quickly detect flaws in different chip designs.	*The field-programmable can be reprogrammed to adapt new, evolving and custom networks .*
The floor needs to be running 24 hours	FPGA has robustness so they are designed to have 100 % on-time performance and can be continuously running 24 hours a day , 7 days a week, 365 days a year
No issues with budget	*This allows the the installation of FPGA*

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).
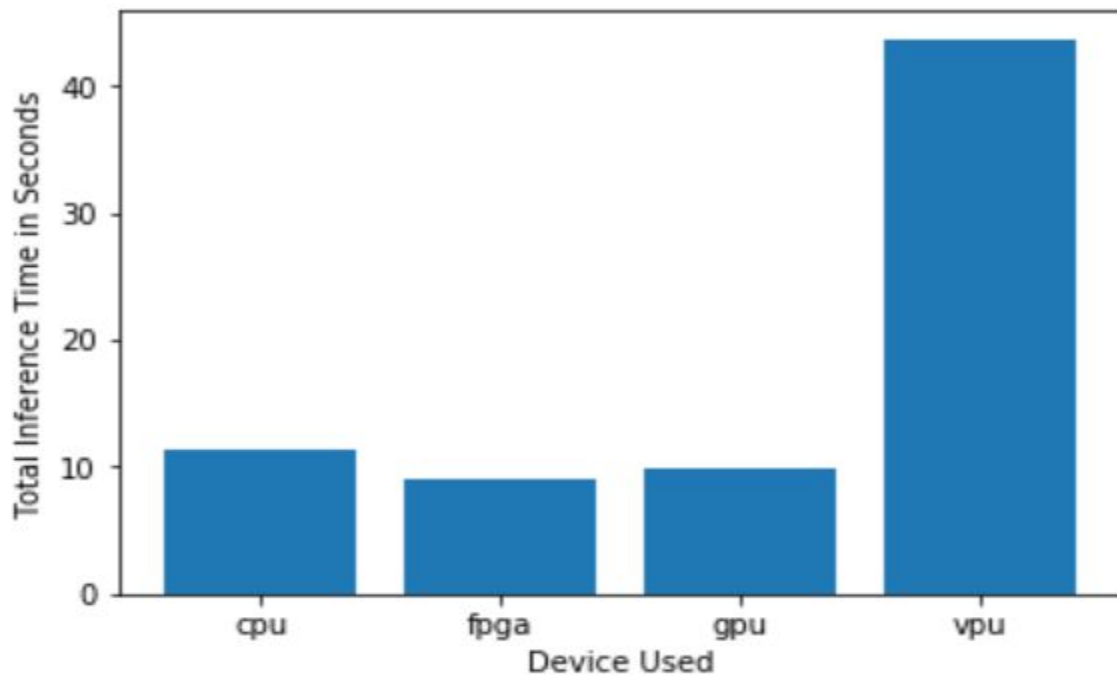
Inference Time in Seconds
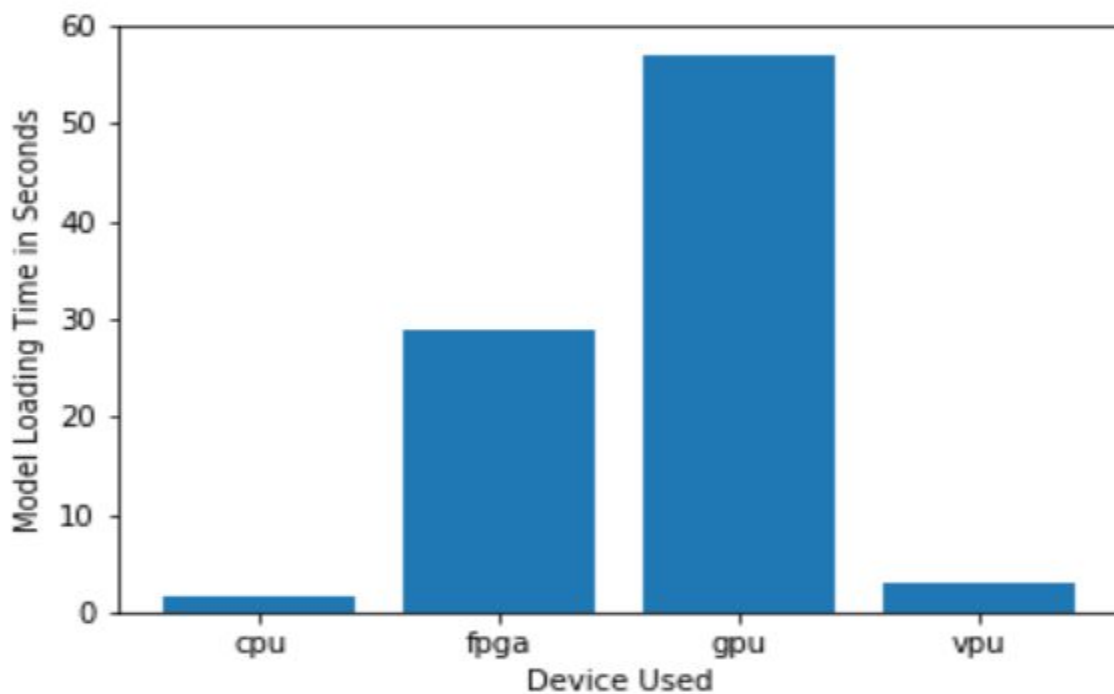
Model Load Time
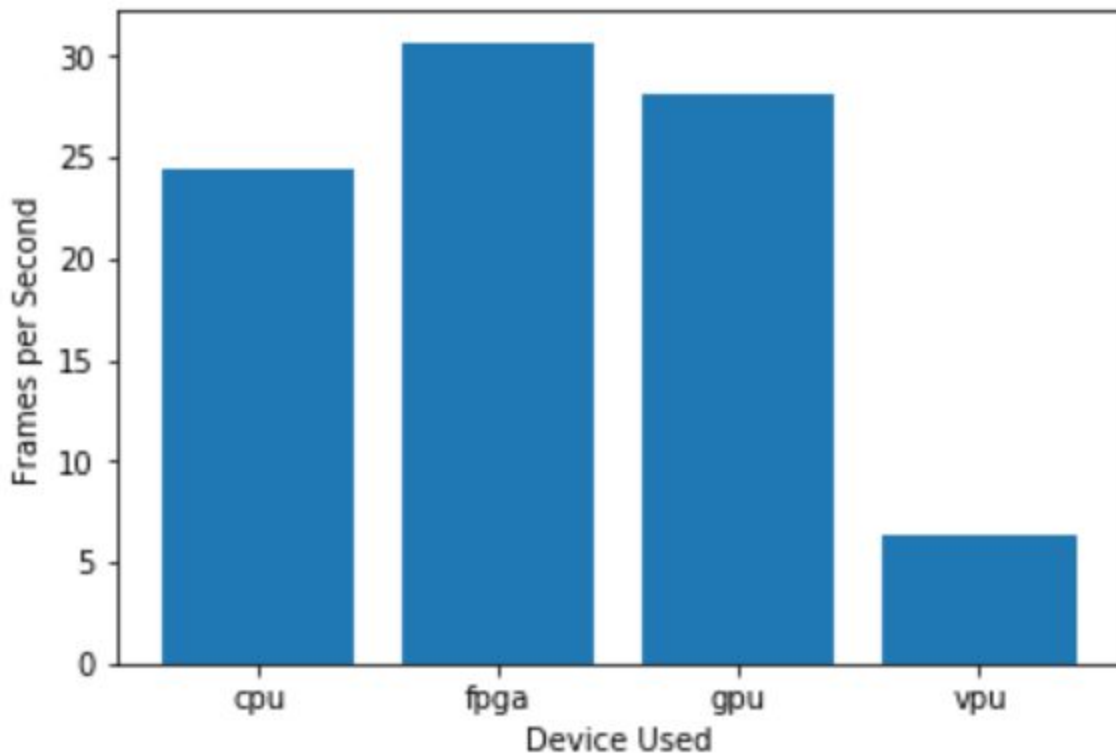
UDACITY

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

Based on the graphs shown above we can conclude that FPGA is the recommended device for the manufacturing scenario as it has the lowest inference time and highest frames per second . Also the client requirements were met by the FPGA , these include :
    1.   *Long life span : FPGA can last for 10 years .*
    2.   *Flexibility : it can be reprogrammed.*
    3.   *Robustness : it can work 24 hours a day 7 days a week 365 days a year.*
    4.   *No budget constraint by the client*
The reasons to not recommend CPU, GPU is due to their life span as they do not last 10 years . On the other hand , VPU achieved 6 frames per second which is close to the client requirement but the client requested a repurpose device which can be demanding when choosing VPU.

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.

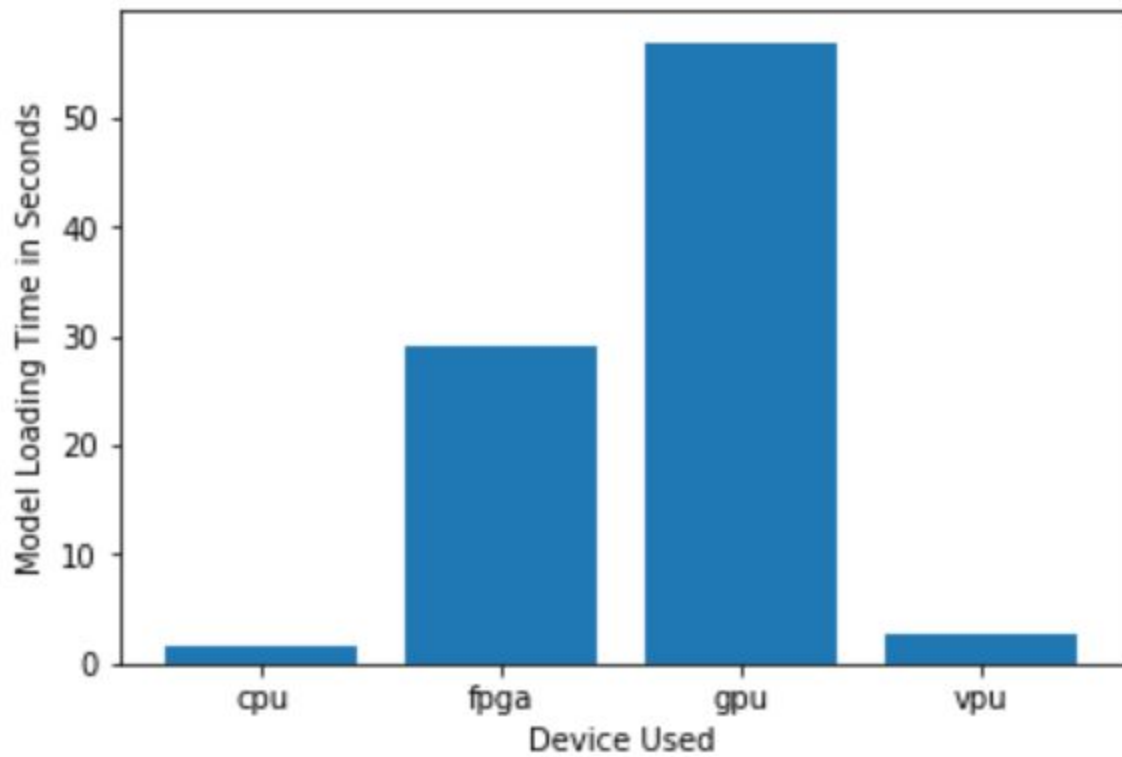| Which hardware might be most appropriate for this scenario? (CPU / IGPU / VPU / FPGA) |
|---|
| *CPU* |

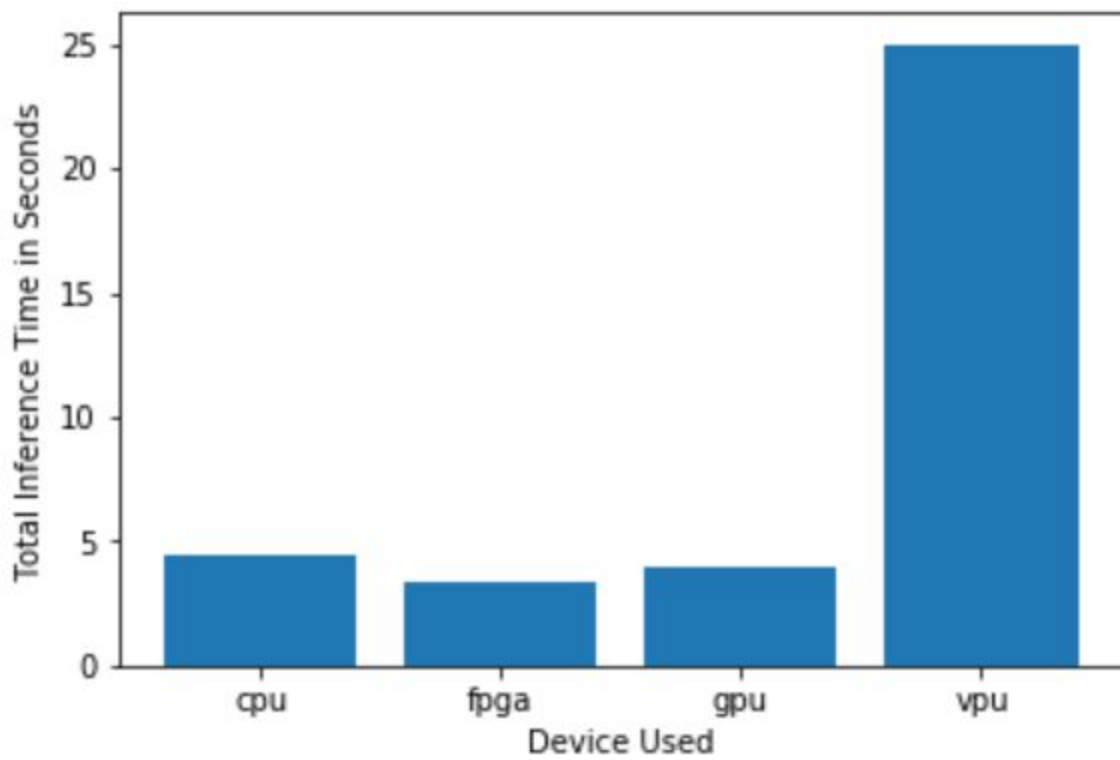| Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
The client is not paying money to invest in additional hardware	There is existing hardware that contain CPU and no need to purchase new equipment required
The client would like to save as much as possible on electric bill and a system that does not run 24/7	The CPU will not run 24/7 and the CPU will not contribute much to the electric bill so there are no related bill costs associated with it .

Queue Monitoring Requirements

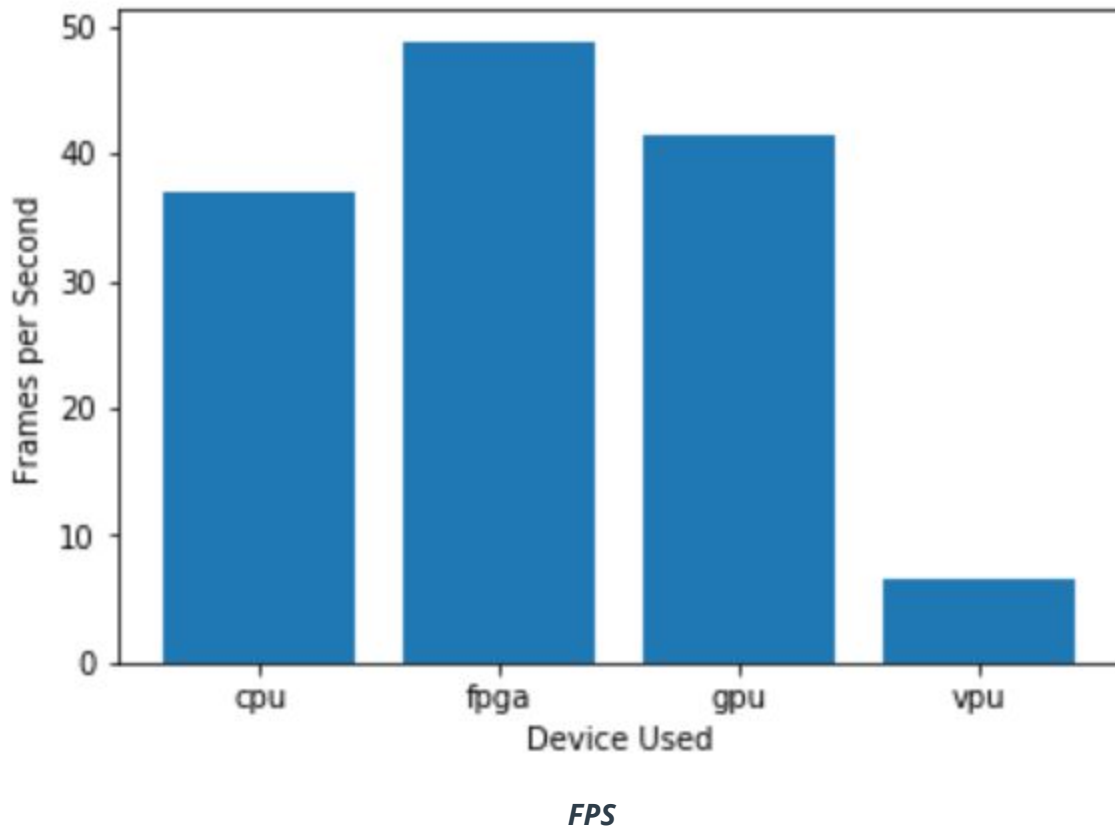| Maximum number of people in the queue	*2*
Model precision chosen (FP32, FP16, or Int8)	*FP32*

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

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
The CPU is the recommended hardware for the client problem in this scenario as the client has already available hardware that can be utilized without purchasing any hardware and additional cost related to electrical bills . According to the graphs FPGA shows the best performance a month the hardware but it does not satisfy the client's 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 |

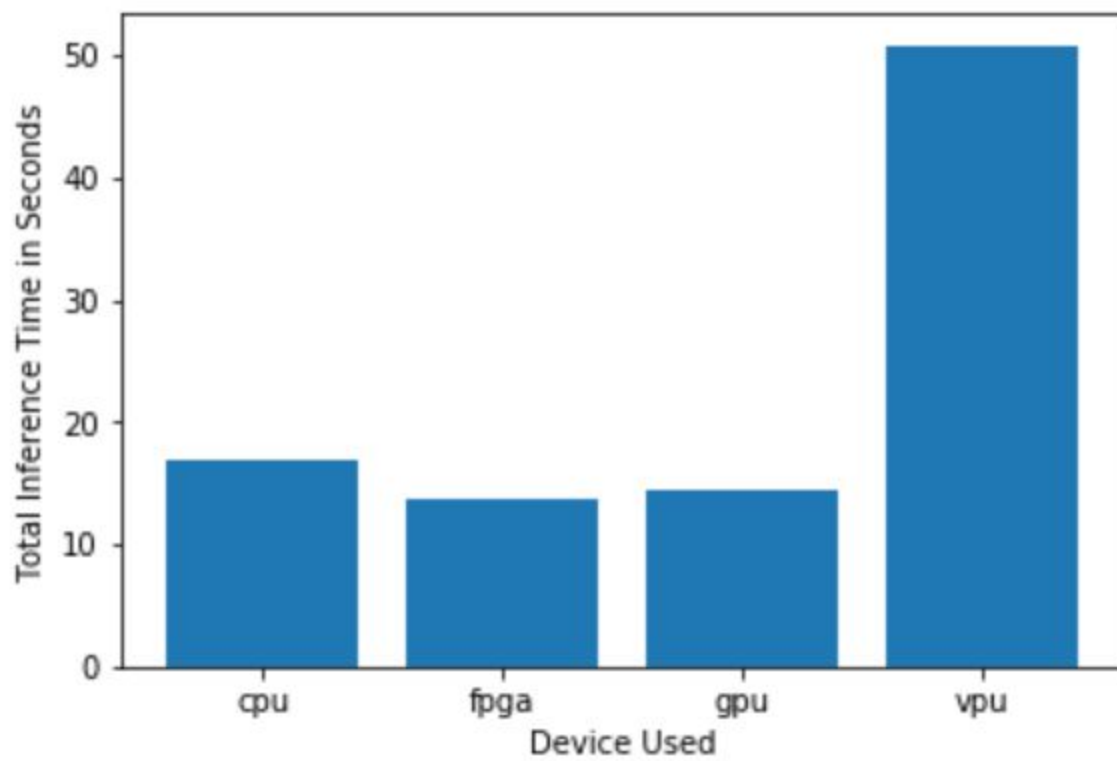| Requirement Observed (Include at least two.)	How does the chosen hardware meet this requirement?
The client budget allows for a maximum $300 per machine .	VPU such as NCS2 is an expensive option and typically costs around $70 to $100 . VPU or NCS2 is only about 27.40 mm in size
The client is looking to save as much as possible on future power requirements	NCS2 is meant to be a low-power device .

Queue Monitoring Requirements

Maximum number of people in the queue	7
Model precision chosen (FP32, FP16, or Int8)	FP16

Test Results

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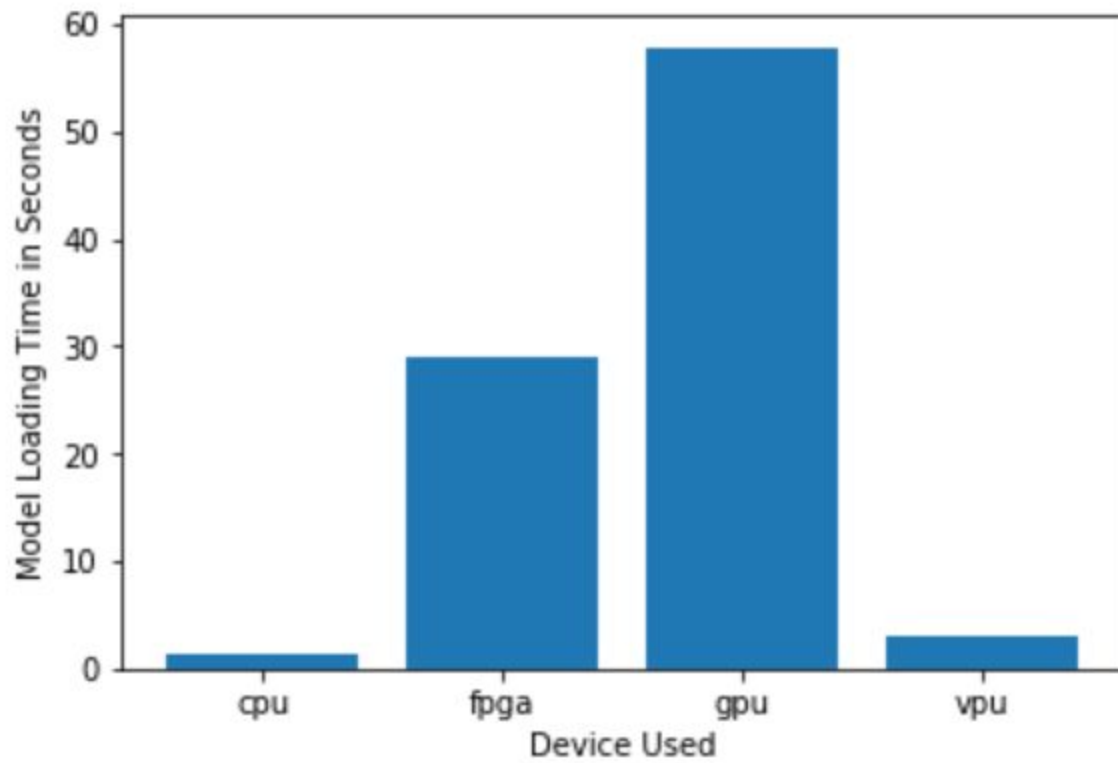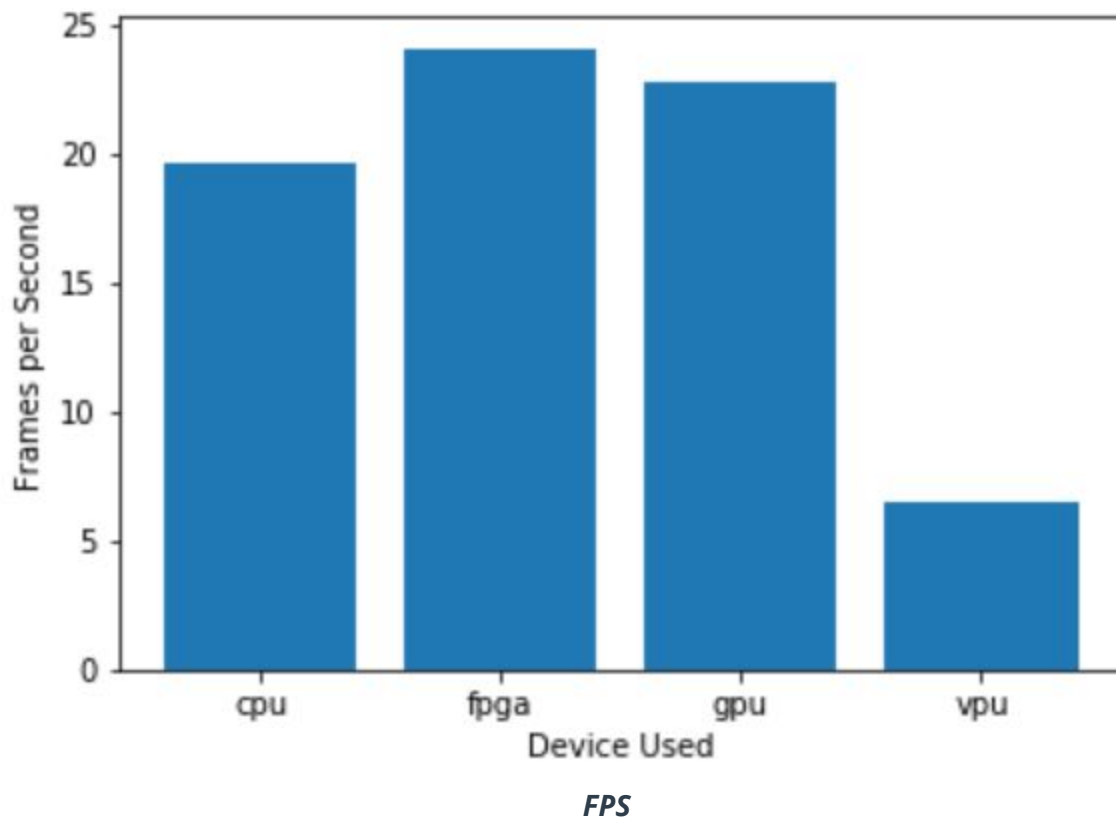
Model Load Time

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
The client has set two requirements, one of them is price limitation of a maximum of $300 which is within the range VPU . The other requirements include power requirement and inference which the hardware meets