Congratulations! You passed!

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1. In Neural Style Transfer when initializing the *generated image* from the *content image*,which of the following is true? Check all that apply. **1 / 1 point**

- [x] Initially the *content loss* will be equal or close to zero because both the *content image* and *generated* image are the same image.

  Correct
  Correct!

- [ ] Your goal for the *generated image* is to increase the *style loss* and decrease the *content loss* while keeping the overall *accumulated loss* low.
- [x] Your goal for the *generated image* is to increase the *content loss* and decrease the *style loss*, while keeping the overall *accumulated loss* low.

  Correct
  Correct! Since the *generated image* is initialized from the *content image*, you want it to inherit attributes from the *style image* (reduce *style loss*), but also not lose all of its attributes inherited from the *content image* (increase *content loss*).

- [ ] Initially the *style loss* will be equal or close to zero because both, the *content* and *generated*, images are the same.

2. What does tf.keras.applications.vgg19.preprocess_input do? **1 / 1 point**

- (•) The function centers the distribution of pixel values of an image around zero.
- ( ) The function sets the pixel values of an image between 0 and 1.

  Correct
  Correct! This is called standardization.

3. From which part of a CNN architecture can you extract the "content" of an image? **1 / 1 point**

- ( ) The initial layers of the architecture.
- (•) From the deeper layers of the architecture.

  Correct
  Correct! If you recall the lecture we used only the deeper layer of the CNN for computing *content loss* because that layer holds the information of the *content* of an image.

4. Consider the values given in the image below and calculate the *content loss* value. **1 / 1 point**

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Correct
Correct!

5. Fill in the missing code below: **1 / 1 point**

```
def get_content_loss(generated_image, content_image):
    return # YOUR CODE HERE
```

- [x] 0.5 * tf.reduce_sum(tf.square(content_image - generated_image))

  Correct
  Correct! Even though the original formula is *generated_image - content_image*, since you are *squaring* the difference it doesn't matter what you subtract out of what.

- [ ] tf.reduce_sum(tf.square(generated_image - content_image))
- [x] 0.5 * tf.reduce_sum(tf.square(generated_image - content_image))

  Correct
  Correct!

- [ ] tf.reduce_sum(tf.square(content_image - generated_image))

6. Consider the following code snippet. How will you include *Total Loss Variation* in it? Use TensorFlow as *tf*. **1 / 1 point**

(Answer in the format, **x + y(z)**, considering python's spacing convention)

```
def calculate_gradients(image, content_targets,
                        style_targets, style_weight,
                        content_weight,with_regularization=True):

    total_variation_weight = 30
    with tf.GradientTape() as tape:
      if with_regularization:
        loss += # YOUR CODE HERE

    gradients = tape.gradient(loss, image)
    return gradients
```

```
total_variation_weight * tf.image.total_variation(image)
```

Correct
Correct!