In [1]:

```
import numpy as np
import matplotlib.pyplot as plt
import tensorflow as tf
from tensorflow import keras
```

In [2]:

```
fashion_mnist = keras.datasets.fashion_mnist
```

In [3]:

```
(train_img, train_label), (test_img, test_label) = fashion_mnist.load_data()
```

In [4]:

```
train_img = train_img / 255.0
test_img = test_img / 255.0
```

In [5]:

```
class_names = ['T-shirt/top', 'Trouser', 'Pullover', 'Dress', 'Coat', 'Sandal', 'Shirt',
```

In [6]:

```
plt.figure(figsize = (10, 10))
for i in range(25):
    plt.subplot(5, 5, i+1)
    plt.xticks([])
    plt.yticks([])
    plt.grid(False)
    plt.xlabel(class_names[train_label[i]])
    plt.imshow(train_img[i])
plt.show()
```

In [7]:

```
model = keras.Sequential()
model.add(keras.layers.Flatten(input_shape = (28, 28)))
model.add(keras.layers.Dense(128, activation = 'relu'))
model.add(keras.layers.Dense(10, activation = 'softmax'))
model.compile(optimizer = 'adam', loss = 'sparse_categorical_crossentropy', metrics = ['
```

In [8]:

```
model.fit(train_img, train_label, epochs = 10)
```

```
Epoch 1/10
1875/1875 [==============================] - 5s 2ms/step - loss: 0.4916 -
accuracy: 0.8267
Epoch 2/10
1875/1875 [==============================] - 5s 2ms/step - loss: 0.3681 -
accuracy: 0.8674
Epoch 3/10
1875/1875 [==============================] - 5s 2ms/step - loss: 0.3323 -
accuracy: 0.8776
Epoch 4/10
1875/1875 [==============================] - 5s 2ms/step - loss: 0.3098 -
accuracy: 0.8862
Epoch 5/10
1875/1875 [==============================] - 5s 2ms/step - loss: 0.2932 -
accuracy: 0.8923
Epoch 6/10
1875/1875 [==============================] - 5s 2ms/step - loss: 0.2786 -
accuracy: 0.8962
Epoch 7/10
1875/1875 [==============================] - 5s 2ms/step - loss: 0.2670 -
accuracy: 0.9011
Epoch 8/10
1875/1875 [==============================] - 5s 2ms/step - loss: 0.2551 -
accuracy: 0.9047
Epoch 9/10
1875/1875 [==============================] - 5s 2ms/step - loss: 0.2456 -
accuracy: 0.9087
Epoch 10/10
1875/1875 [==============================] - 5s 2ms/step - loss: 0.2361 -
accuracy: 0.9122
```

Out[8]:

```
<keras.callbacks.History at 0x1e441f5ed00>
```

In [9]:

```
test_loss, test_acc = model.evaluate(test_img, test_label)
print("test_loss = ", test_loss)
print("test_acc = ", test_acc)
```

```
313/313 [==============================] - 1s 2ms/step - loss: 0.3310 - a
ccuracy: 0.8842
test_loss =  0.3309584856033325
test_acc =  0.8841999769210815
```

In [10]:

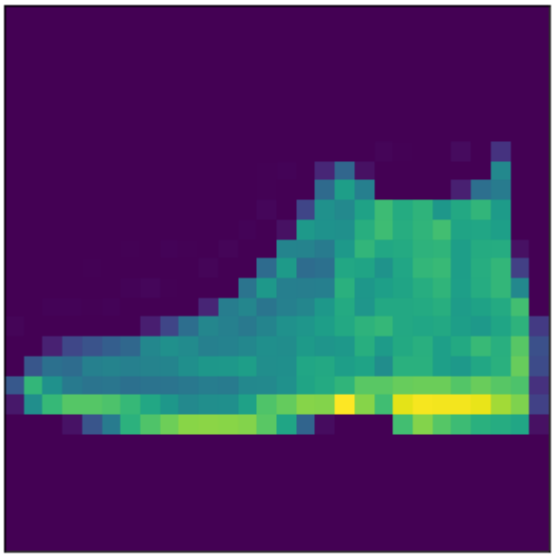
```
pred = model.predict(test_img)
```

In [14]:

```
def plot_pred(i, pred_arr, true_label, img):
    pred_arr, true_label, img = pred_arr[i], true_label[i], img[i]
    plt.grid(False)
    plt.xticks([])
    plt.yticks([])
    plt.imshow(img)
    pred_label = np.argmax(pred_arr)
    if pred_label == true_label:
        color = 'blue'
    else:
        color = 'red'
    plt.xlabel("{} {} {}".format(class_names[pred_label], 100*np.max(pred_arr), class_na
```

In [15]:

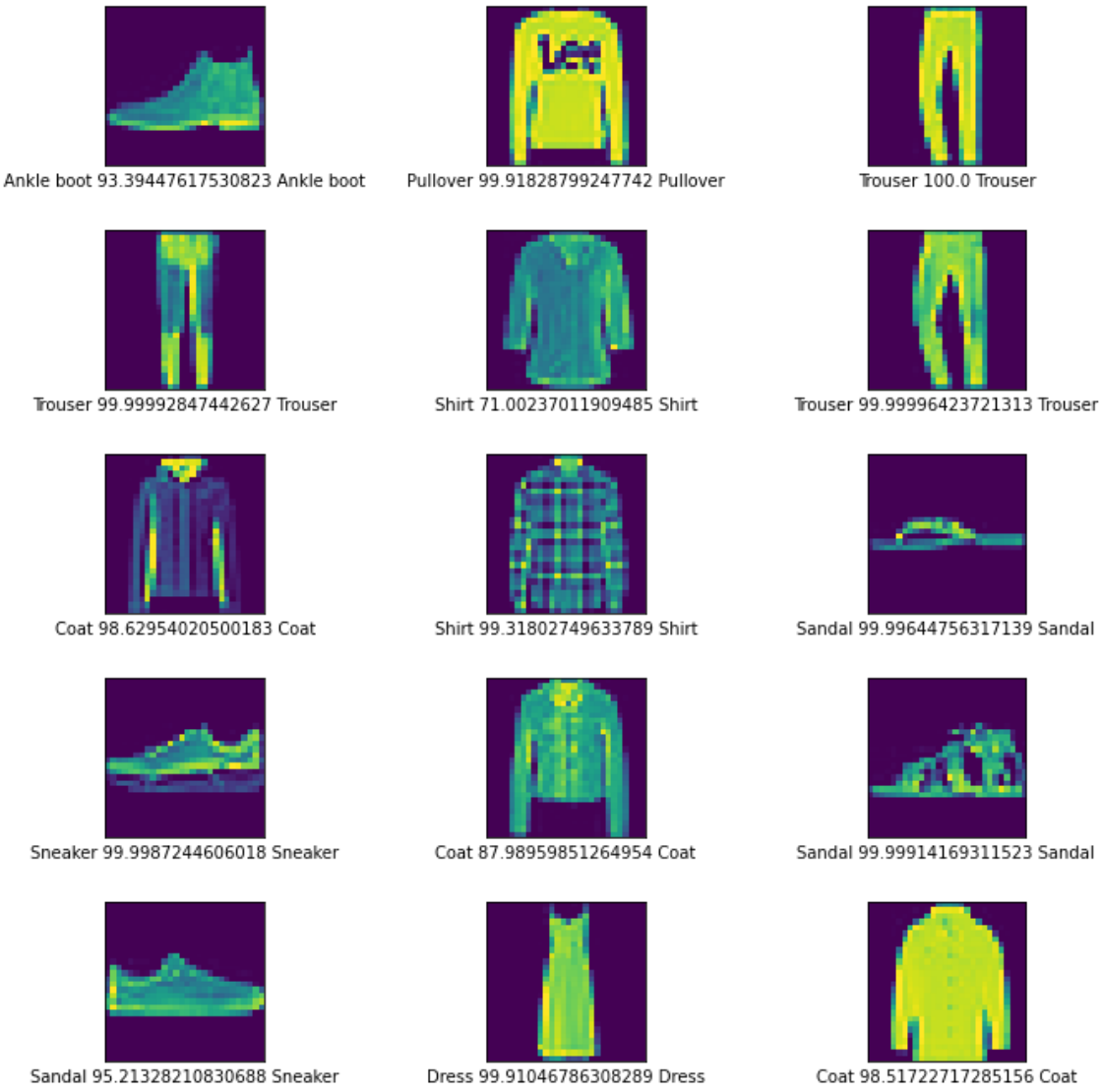
```
i = 0
plt.figure(figsize = (5, 5))
plot_pred(i, pred, test_label, test_img)
```



Ankle boot 93.39447617530823 Ankle boot

In [23]:

```
num_rows = 5
num_cols = 3
num_images = num_rows*num_cols
plt.figure(figsize=(12, 12))
for i in range(num_images):
    plt.subplot(num_rows, 2*num_cols, 2*i+1)
    plot_pred(i, pred, test_label, test_img)
plt.show()
```



In [ ]: