Image classification using neural network

```python
In [2]: import matplotlib.pyplot as plt
        import numpy as np
        import tensorflow as tf
        from tensorflow import keras
        from tensorflow.keras.datasets import mnist,cifar10,fashion_mnist
        from tensorflow.keras import layers
        from tensorflow.keras.layers import Embedding,Dense,SimpleRNN,LSTM,GRU,Dropout,Flatten
        from tensorflow.keras.models import Sequential,Model
        from tensorflow.keras.applications import VGG19
        from tensorflow.image import grayscale_to_rgb,resize
        from tensorflow.keras.utils import to_categorical
        from tensorflow.keras import regularizers
        from tensorflow.keras import optimizers
        from tensorflow.keras.initializers import HeNormal,GlorotNormal
```

WARNING:tensorflow:From D:\JUPYTER FOLDER\Lib\site-packages\keras\src\losses.py:2976: The name tf.losses.spa
rse_softmax_cross_entropy is deprecated. Please use tf.compat.v1.losses.sparse_softmax_cross_entropy instea
d.

```python
In [3]: (train_images,train_labels),(test_images,test_labels)=fashion_mnist.load_data()
        train_images,test_images=train_images/255.0,test_images/255.0
```

In [4]:
```python
model=Sequential([
    Flatten(input_shape=(28,28,1)),
    Dense(256,activation='relu'),
    Dense(128,activation='relu'),
    Dense(64,activation='relu'),
    Dense(10,activation='softmax')
])
model.compile(metrics=['accuracy'],loss='sparse_categorical_crossentropy',optimizer='adam')
```

WARNING:tensorflow:From D:\JUPYTER FOLDER\Lib\site-packages\keras\src\backend.py:873: The name tf.get_default_graph is deprecated. Please use tf.compat.v1.get_default_graph instead.

WARNING:tensorflow:From D:\JUPYTER FOLDER\Lib\site-packages\keras\src\optimizers__init__.py:309: The name tf.train.Optimizer is deprecated. Please use tf.compat.v1.train.Optimizer instead.

In [5]:
```python
history=model.fit(train_images,train_labels,epochs=1,validation_data=(test_images,test_labels))
loss,accuracy=model.evaluate(test_images,test_labels)
```

WARNING:tensorflow:From D:\JUPYTER FOLDER\Lib\site-packages\keras\src\utils\tf_utils.py:492: The name tf.ragged.RaggedTensorValue is deprecated. Please use tf.compat.v1.ragged.RaggedTensorValue instead.

WARNING:tensorflow:From D:\JUPYTER FOLDER\Lib\site-packages\keras\src\engine\base_layer_utils.py:384: The name tf.executing_eagerly_outside_functions is deprecated. Please use tf.compat.v1.executing_eagerly_outside_functions instead.

1875/1875 [==============================] - 10s 5ms/step - loss: 0.4909 - accuracy: 0.8212 - val_loss: 0.4249 - val_accuracy: 0.8490
313/313 [==============================] - 1s 2ms/step - loss: 0.4249 - accuracy: 0.8490

In [ ]:

In [7]:
```python
classes=['a','b','c','d','e','f','g','h','i','j']

for _ in range(3):
    index=np.random.randint(0,len(test_images))
    actual_label=test_labels[index]
    input_image=test_images[index]
    input_image=np.expand_dims(input_image,axis=0)
    predict=model.predict(input_image)
    label=np.argmax(predict)
    print(f'actual_label: {classes[actual_label]} predicted_label : {classes[label]}')
    plt.imshow(test_images[index],cmap='gray')
    plt.show()
```
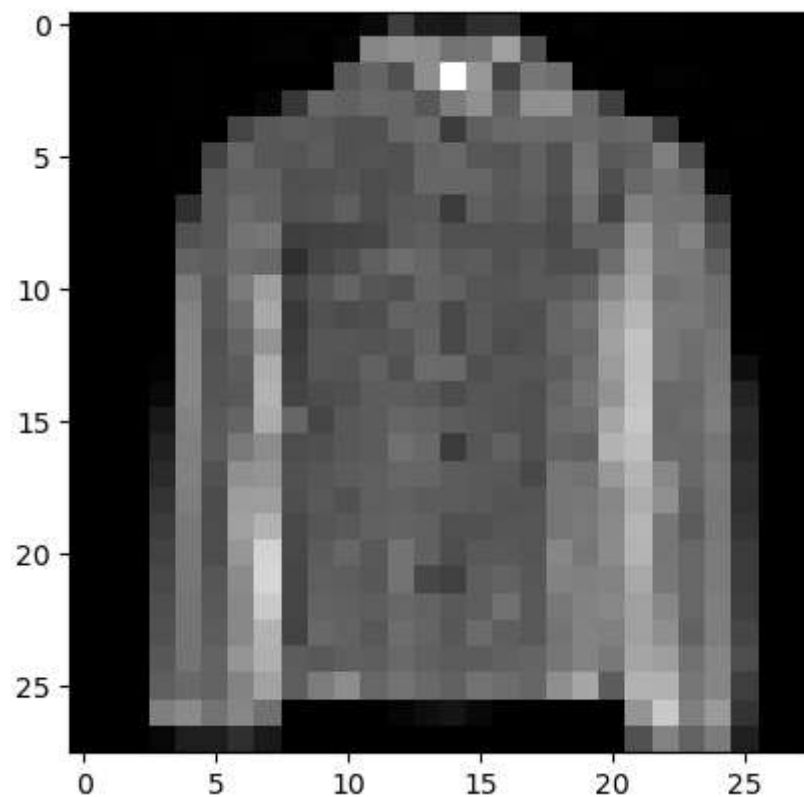
```
1/1 [==============================] - 0s 36ms/step
actual_label: g predicted_label : g
```
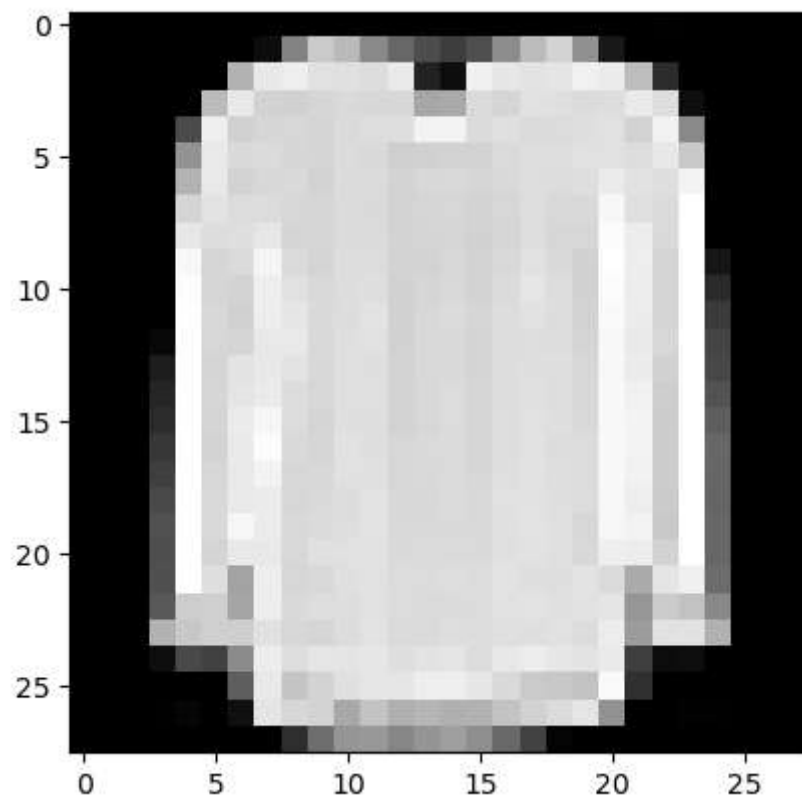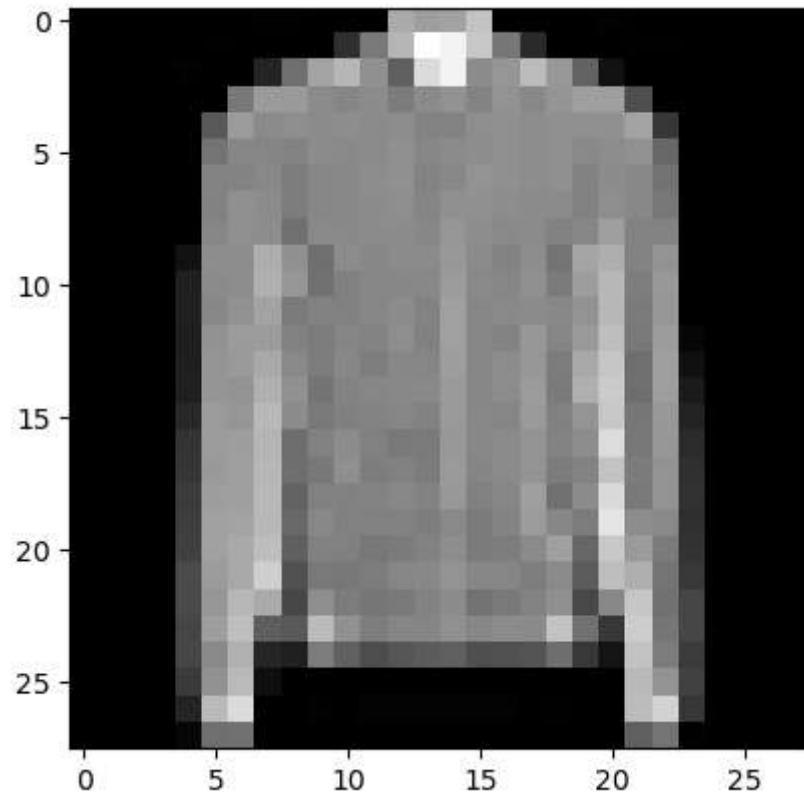
```
1/1 [==============================] - 0s 35ms/step
actual_label: e predicted_label : e
```



```
1/1 [==============================] - 0s 36ms/step
actual_label: e predicted_label : c
```

In [ ]: