Model Development Phase Template

Date	20 June 2025
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Project Title	Human-nail-image-processing-using-deep-learning
Maximum Marks	10 Marks

Initial Model Training Code, Model Validation and Evaluation Report

Initial Model Training Code

```
vgg = VGG16(input_shape=imageSize + [3], weights='imagenet', include_top=False)

for layer in vgg.layers:
    layer.trainable = False

x = Flatten()(vgg.output)

prediction = Dense(17, activation='softmax')(x)

model = Model(inputs=vgg.input, outputs=prediction)

model.compile(
    loss='categorical_crossentropy',
    optimizer='adam',
    metrics=['accuracy']
)

train_datagen = ImageDataGenerator(rescale=1./255,
                                   shear_range=0.2,
                                   horizontal_flip=True,
                                   zoom_range=0.2)
test_datagen = ImageDataGenerator(rescale=1./255)


train_path = r'D:\Swayam AI Project\Dataset\train-20250520T165148Z-1-001\train'
test_path = r'D:\Swayam AI Project\Dataset\test-20250520T165150Z-1-001\test'

train_set = train_datagen.flow_from_directory(
    train_path,
    target_size=(224, 224),
    batch_size=32,
    class_mode='categorical'
)

test_set = test_datagen.flow_from_directory(
    test_path,
    target_size=(224, 224),
    batch_size=32,
    class_mode='categorical'
)
```

```
r = model.fit(
    train_set,
    validation_data=test_set,
    epochs=100,
    steps_per_epoch=len(train_set)//3,
    validation_steps=len(test_set)//3
)
```

Model Validation and Evaluation Report

Model	Summary	Training and Validation Performance Metrics
Model 1 (VGG16)	**Layer Summary:** • VGG16 base model **Total Parameters:** 15,141,201 **Trainable Parameters:** 426,513 **Non-trainable Parameters:** 14,714,688	**Training Accuracy**: 94.21% **Validation Accuracy**: 98.44%