```python
# Import libraries
from sklearn.datasets import load_iris
from sklearn.model_selection import train_test_split
from sklearn.ensemble import RandomForestClassifier
from sklearn.metrics import accuracy_score

# Load dataset
iris = load_iris()
X = iris.data
y = iris.target

# Split into training (70%) and testing (30%)
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.3, random_state=42)

# Train the Random Forest Classifier
rf_model = RandomForestClassifier(n_estimators=100, random_state=42)
rf_model.fit(X_train, y_train)

# Predict on test data
y_pred = rf_model.predict(X_test)

# Calculate accuracy
accuracy = accuracy_score(y_test, y_pred)
print("Model Accuracy:", accuracy)
```

OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS

```
PS C:\Users\zumer\OneDrive\Desktop\lab working\lab 4\Assignment 4>  & 'c:\Users\zumer\AppData\Local\Programs\Python\Python313\pytho
n.exe' 'c:\Users\zumer\.vscode\extensions\ms-python.debugpy-2025.18.0-win32-x64\bundled\libs\debugpy\launcher' '55676' '--' 'c:\Use
rs\zumer\OneDrive\Desktop\lab working\lab 4\Assignment 4\question1.py'
Model Accuracy: 1.0
PS C:\Users\zumer\OneDrive\Desktop\lab working\lab 4\Assignment 4>
```

```python
# Import libraries
from sklearn.datasets import load_breast_cancer
from sklearn.model_selection import train_test_split
from sklearn.svm import SVC
from sklearn.metrics import accuracy_score, confusion_matrix

# Load dataset
data = load_breast_cancer()
X = data.data
y = data.target

# Split data
# Split data
(function) def print(                                    (X, y, test_size=0.2, random_state=42)
    *values: object,
    sep: str | None = " ",
    end: str | None = "\n",
    file: SupportsWrite[str] | None = None,
    flush: Literal[False] = False
) -> None

Prints the values to a stream, or to sys.stdout by default.

sep
  string inserted between values, default a space.
end
  string appended after the last value, default a newline.
print("Accuracy:", acc)
print("Confusion Matrix:\n", cm)
```

```
48         print(f"{feature}: {importance:.3f}")
49
50
51
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68
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70
71
```

=["Fail", ']

Figure 1

Confusion Matrix - Random Forest

Feature Importance:
study_hours: 0.352
attendance: 0.363
marks: 0.286

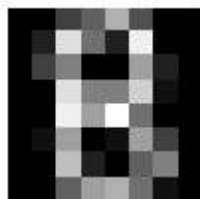question3.py   question4.py ×

question4.py > ...

```
28   # --------------------------------
29   # Step
30   # ----
31   y_pred
32   accura
33
34   print(
35
36   # ----
37   # Step
38   # ----
39   miscla
40
41   plt.fi
42
43   for i,
44       pl
45       pl
46       pl
47       pl
48
49   plt.su
50   plt.sh
51
```
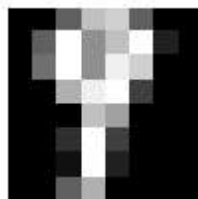
Figure 1

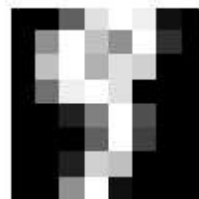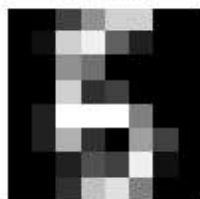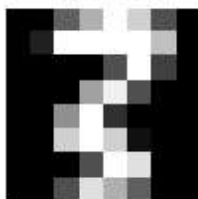## Misclassified Digits (True vs Predicted)

T:8 P:9   T:7 P:9   T:9 P:7   T:9 P:8

T:5 P:6   T:3 P:8   T:9 P:3
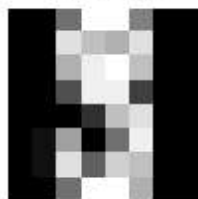
(x, y) = (1.10, 4.68)
[2.00]

OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS

Ln 51

```
:\Users\zumer\AppData\Local\Programs\Python\Python313\python.exe' 'c:\Users\zumer\.vscode\extensions\ms-python.debugpy-2025.18.0-win32-x64\bundle
d\libs\debugpy\launcher' '54626' '--' 'c:\Users\zumer\OneDrive\Desktop\lab working\lab 4\Assignment 4\question4.py' …
PS C:\Users\zumer\OneDrive\Desktop\lab working\lab 4\Assignment 4>  c:; cd 'c:\Users\zumer\OneDrive\Desktop\lab working\lab 4\Assignment 4'; & 'c
:\Users\zumer\AppData\Local\Programs\Python\Python313\python.exe' 'c:\Users\zumer\.vscode\extensions\ms-python.debugpy-2025.18.0-win32-x64\bundle
d\libs\debugpy\launcher' '51019' '--' 'c:\Users\zumer\OneDrive\Desktop\lab working\lab 4\Assignment 4\question5.py'
Random Forest Accuracy: 1.0
SVM Accuracy: 0.7592592592592593
✅ Random Forest performs better.
PS C:\Users\zumer\OneDrive\Desktop\lab working\lab 4\Assignment 4>
```