In [1]:

```
import numpy as np
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import LabelEncoder
from sklearn.ensemble import RandomForestClassifier
```

In [2]:

```
def recommend_helper():

    train_data = pd.read_csv("crop.csv")

    le = LabelEncoder()
    train_data.crop = le.fit_transform(train_data.crop)

    X = train_data.drop('crop', axis = 1)
    y = train_data['crop']

    X_train, X_val, y_train, y_val = train_test_split(X,y,test_size=0.3)

    model = RandomForestClassifier(n_estimators=150)

    model.fit(X_train, y_train)

    return model, le
```

In [3]:

```
def recommend(N, P, K, T, H, ph, R):

    A = [N, P, K, T, H, ph, R]

    model, le = recommend_helper()

    S = np.array(A)
    X = S.reshape(1, -1)

    pred = model.predict(X)

    crop_pred = le.inverse_transform(pred)

    return crop_pred[0]
```

In [4]:

```
recommend(17.0000001, 36.000000, 196.00000, 23.871923, 90.499390, 5.882156, 10)
```

Out[4]:

```
'muskmelon'
```