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Model Building

In [148]:
```
from sklearn import metrics
from sklearn.metrics import classification_report
from sklearn.metrics import confusion_matrix
from sklearn.metrics import accuracy_score
from sklearn.model_selection import cross_val_score
from sklearn.datasets import make_classification
from sklearn.metrics import plot_confusion_matrix
import warnings
warnings.filterwarnings('ignore')
%matplotlib inline
```

1.Random Forest Classifier

In [149]:
```
rfc = RandomForestClassifier()
rfc.fit(x_train, y_train)
predRF = rfc.predict(x_test)
print(classification_report(y_test, predRF))
```

```
              precision    recall  f1-score   support

           0       0.89      0.97      0.93        33
           1       0.96      0.85      0.90        26

    accuracy                           0.92        59
   macro avg       0.92      0.91      0.91        59
weighted avg       0.92      0.92      0.91        59
```

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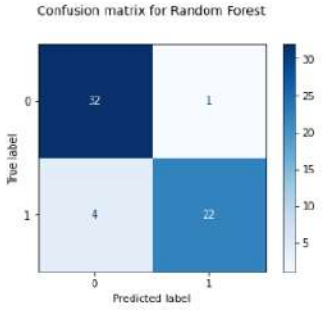
In [150]:
```
plot_confusion_matrix(rfc, x_test, y_test, cmap=plt.cm.Blues)
plt.title('Confusion matrix for Random Forest', y=1.1)
plt.show()
```



2.SVM

SVM With Linear Kernel

In [151]:
```
model = svm.SVC(kernel='linear')
# Training the SVM model with training data
model.fit(x_train, y_train)
```

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2.SVM

SVM With Linear Kernel

In [151]:
```
model = svm.SVC(kernel='linear')
# Training the SVM model with training data
model.fit(x_train, y_train)
```

Out[151]:
```
SVC(kernel='linear')
```
In a Jupyter environment, please rerun this cell to show the HTML representation or trust the notebook.
On GitHub, the HTML representation is unable to render, please try loading this page with nbviewer.org.

In [152]:
```
predsvm = model.predict(x_test)
print(classification_report(y_test, predsvm))
```

```
              precision    recall  f1-score   support

           0       0.76      0.97      0.85        33
           1       0.94      0.62      0.74        26

    accuracy                           0.81        59
   macro avg       0.85      0.79      0.80        59
weighted avg       0.84      0.81      0.81        59
```

In [153]:
```
plot_confusion_matrix(model, x_test, y_test, cmap=plt.cm.Blues)
plt.title('Confusion matrix for Random Forest', y=1.1)
plt.show()
```

Confusion matrix for Random Forest

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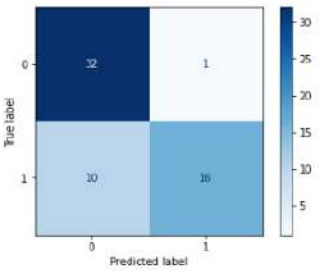

3.Decision Tree Classifier

In [154]:
```
dtc = DecisionTreeClassifier()
dtc.fit(x_train, y_train)
predDT = dtc.predict(x_test)
print(classification_report(y_test, predDT))
```

```
              precision    recall  f1-score   support

           0       0.97      0.88      0.92        33
           1       0.86      0.96      0.91        26

    accuracy                           0.92        59
   macro avg       0.91      0.92      0.91        59
weighted avg       0.92      0.92      0.92        59
```

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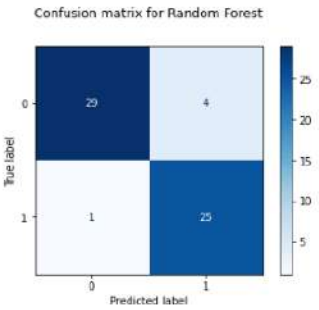
In [155]:
```
plot_confusion_matrix(dtc, x_test, y_test, cmap=plt.cm.Blues)
plt.title('Confusion matrix for Random Forest', y=1.1)
plt.show()
```



Comparision Table

In [156]:
```
from sklearn.metrics import precision_score,recall_score ,accuracy_score, f1_score, r2_score, log_loss

chart = {
        'Metric':["Accuracy", "F1-Score", "Recall", "Precision", "R2-Score"],
        'DT':[accuracy_score(y_test, predDT), f1_score(y_test, predDT), recall_score(y_test, predDT), precision_score(y_test, pre
        'RF':[accuracy_score(y_test, predRF), f1_score(y_test, predRF), recall_score(y_test, predRF), precision_score(y_test, pre
        'SVM':[accuracy_score(y_test, predsvm), f1_score(y_test, predsvm), recall_score(y_test, predsvm), precision_score(y_test,
        }
```

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Comparision Table

In [156]:
```
from sklearn.metrics import precision_score,recall_score ,accuracy_score, f1_score, r2_score, log_loss

chart = {
        'Metric':["Accuracy", "F1-Score", "Recall", "Precision", "R2-Score"],
        'DT':[accuracy_score(y_test, predDT), f1_score(y_test, predDT), recall_score(y_test, predDT), precision_score(y_test, pre
        'RF':[accuracy_score(y_test, predRF), f1_score(y_test, predRF), recall_score(y_test, predRF), precision_score(y_test, pre
        'SVM':[accuracy_score(y_test, predsvm), f1_score(y_test, predsvm), recall_score(y_test, predsvm), precision_score(y_test,
        }
chart = pd.DataFrame(chart)
```

In [157]:
```
display(chart)
```

	Metric	DT	RF	SVM
0	Accuracy	0.915254	0.915254	0.813559
1	F1-Score	0.909091	0.897959	0.744186
2	Recall	0.961538	0.846154	0.615385
3	Precision	0.862069	0.956522	0.941176
4	R2-Score	0.656177	0.656177	0.243590

USER INPUT TESTING

In [158]:
```
a=parkinsons_data.iloc[0].to_dict()              #  parkinson disease-----1
b=parkinsons_data.iloc[1].to_dict()              #  parkinson disease-----1
```

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