TASK 03

- Build a decision tree classifier to predict whether a customer will purchase a product or service based on their demographic and behavioral data. Use a dataset such as the Bank Marketing dataset from the UCI Machine Learning Repository.

Bank Marketing Dataset

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Markdown JupyterLab Python 3 (ipykernel)

TASK 3 - BY Gaurav Singh Yadav

Task 3 :- Decision Tree Classifier on Bank Marketing Dataset

This project builds a decision tree classifier to predict whether a customer will purchase a product or service, using demographic and behavioral data. It utilizes the Bank Marketing dataset from the UCI Machine Learning Repository.

[2]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
import warnings
warnings.filterwarnings('ignore')
%matplotlib inline
```

[7]:
```
df = pd.read_csv("bank-additional.csv",delimiter=';')
df.rename(columns={'y':'deposit'}, inplace=True)
df.head()
```

[7]:

	age	job	marital	education	default	housing	loan	contact	month	day_of_week	...	campaign	pdays	previous	poutcome	emp.var.rate	cons.price.idx	cons.conf.idx	euribor3m	nr.employed	deposit
0	30	blue-collar	married	basic.9y	no	yes	no	cellular	may	fri	...	2	999	0	nonexistent	-1.8	92.893	-46.2	1.313	5099.1	no
1	39	services	single	high.school	no	no	no	telephone	may	fri	...	4	999	0	nonexistent	1.1	93.994	-36.4	4.855	5191.0	no
2	25	services	married	high.school	no	yes	no	telephone	jun	wed	...	1	999	0	nonexistent	1.4	94.465	-41.8	4.962	5228.1	no
3	38	services	married	basic.9y	no	unknown	unknown	telephone	jun	fri	...	3	999	0	nonexistent	1.4	94.465	-41.8	4.959	5228.1	no
4	47	admin.	married	university.degree	no	yes	no	cellular	nov	mon	...	1	999	0	nonexistent	-0.1	93.200	-42.0	4.191	5195.8	no

5 rows × 21 columns

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Code

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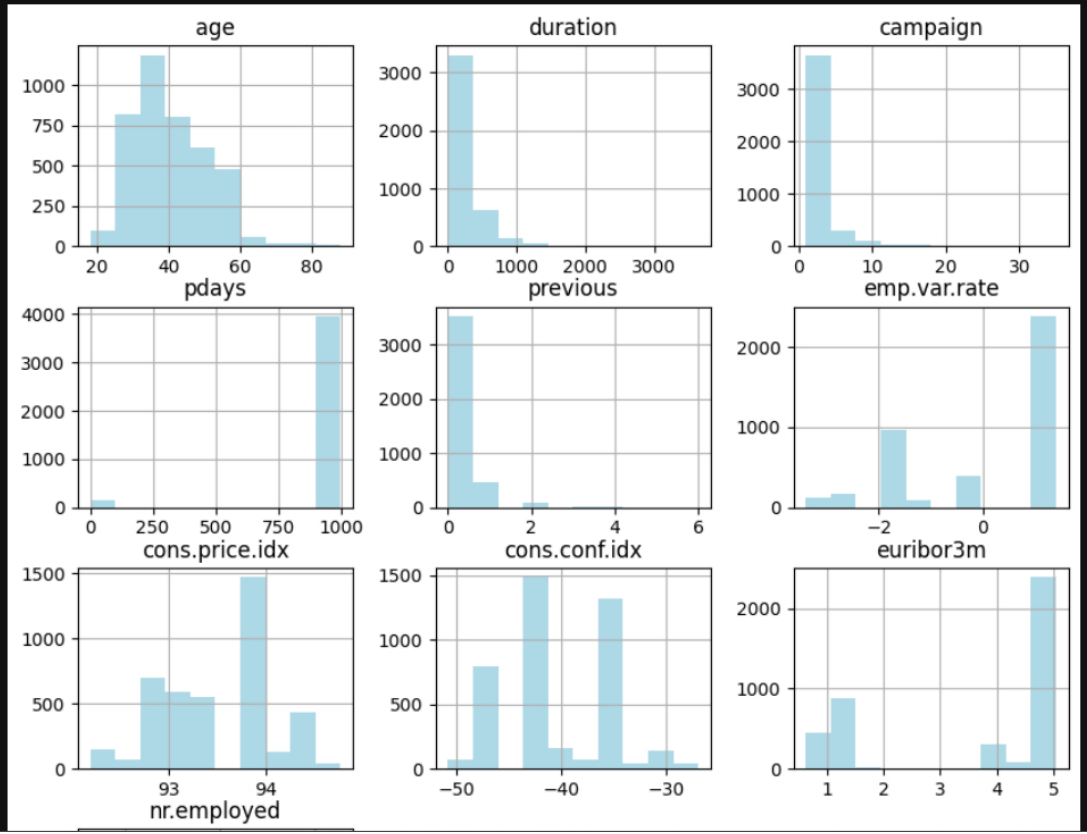
[25]:
```
df.hist(figsize=(10,10),color='lightblue')
plt.show()
```



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Code

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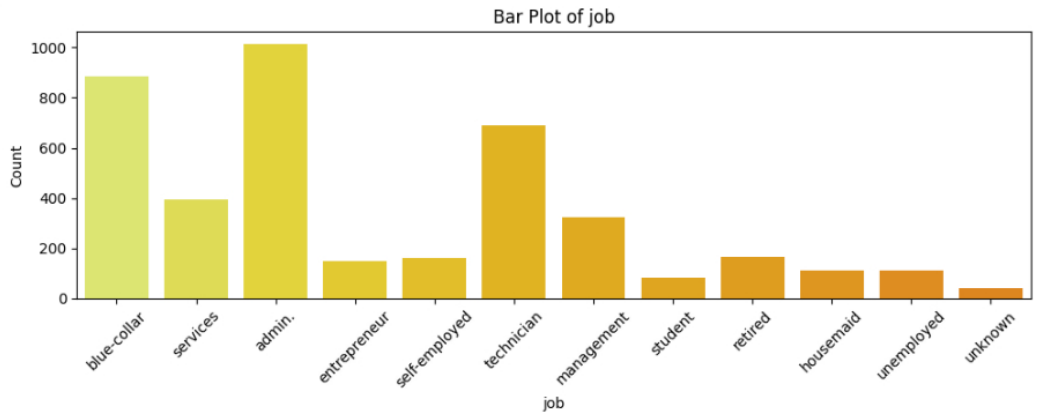

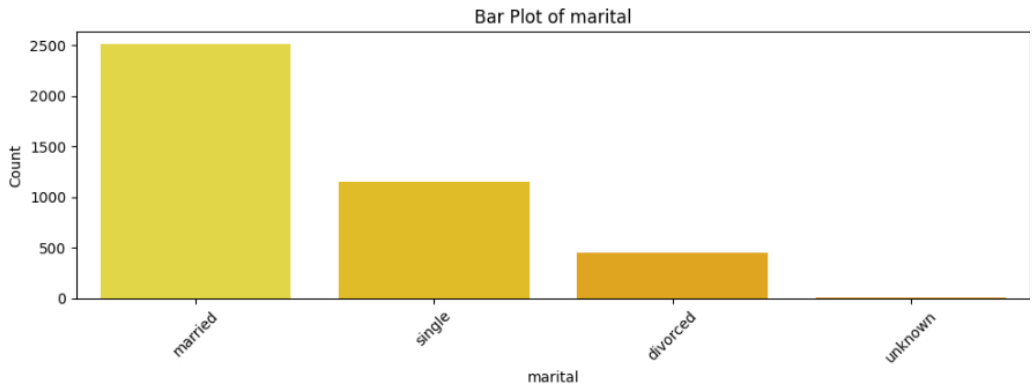

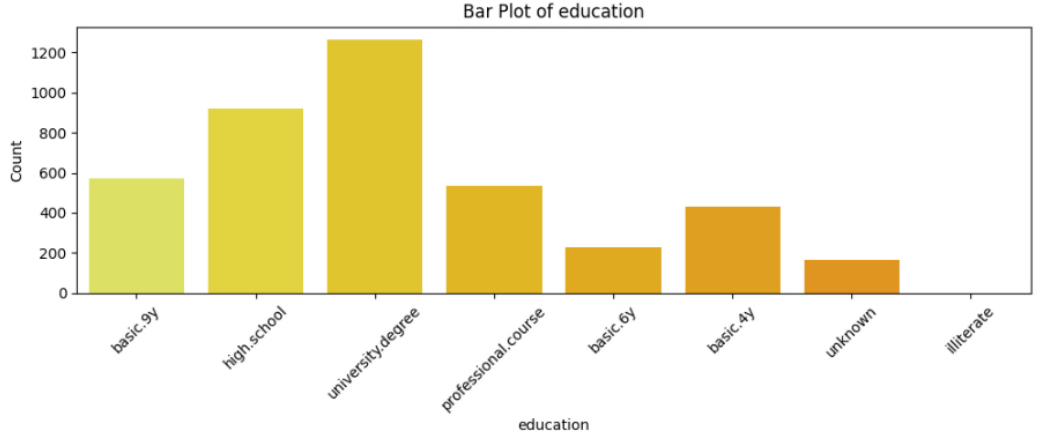

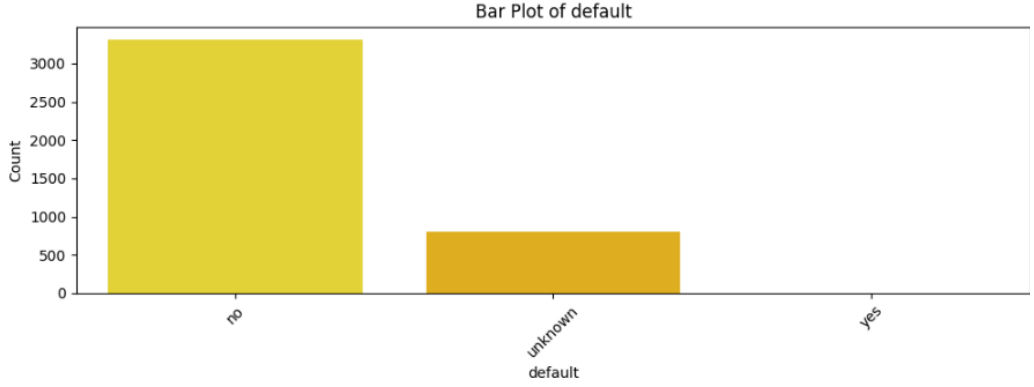

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Code JupyterLab Python 3 (ipykernel)

Decision Tree Classification.

[44]:
```
from sklearn.model_selection import train_test_split
```

[45]:
```
x_train,x_test,y_train,y_test = train_test_split(x,y,test_size=0.25,random_state=1)
print(x_train.shape)
print(x_test.shape)
print(y_train.shape)
print(y_test.shape)
```

```
(3089, 17)
(1030, 17)
(3089,)
(1030,)
```

[47]:
```
from sklearn.metrics import confusion_matrix,classification_report,accuracy_score

def eval_model(y_test,y_pred):
    acc = accuracy_score(y_test,y_pred)
    print('Accuracy_Score',acc)
    cm = confusion_matrix(y_test,y_pred)
    print('Confusion Matrix\n',cm)
    print('Classification Report\n',classification_report(y_test,y_pred))

def mscore(model):
    train_score = model.score(x_train,y_train)
    test_score = model.score(x_test,y_test)
    print('Training Score',train_score)
    print('Testing Score',test_score)
```

[48]:
```
from sklearn.tree import DecisionTreeClassifier

dt = DecisionTreeClassifier(criterion='gini',max_depth=5,min_samples_split=10)
dt.fit(x_train,y_train)
```

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Code JupyterLab Python 3 (ipykernel)

```
       'contact', 'month', 'day_of_week', 'duration', 'campaign', 'pdays',
       'previous', 'poutcome', 'cons.price.idx', 'cons.conf.idx'],
      dtype='object')
['no', 'yes']
```

[58]:
```
plt.figure(figsize=(30,10))
plot_tree(dt,class_names=cn,filled=True)
plt.show()
```