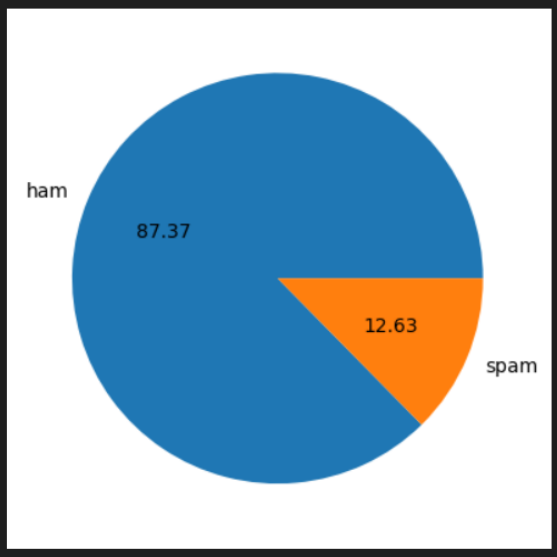
Output Sreenshots:

```python
class GAS(keras.Model):
    """
    The GAS model
    """

    def __init__(self, args: argparse.ArgumentParser().parse_args()) -> None:

        super().__init__()

        self.class_size = args.class_size
        self.reviews_num = args.reviews_num
        self.input_dim_i = args.input_dim_i
        self.input_dim_u = args.input_dim_u
        self.input_dim_r = args.input_dim_r
        self.input_dim_r_gcn = args.input_dim_r_gcn
        self.output_dim1 = args.output_dim1
        self.output_dim2 = args.output_dim2
        self.output_dim3 = args.output_dim3
        self.num_features_nonzero = args.num_features_nonzero
        self.gcn_dim = args.gcn_dim
        self.h_i_size = args.h_i_size
        self.h_u_size = args.h_u_size

        # GAS layers initialization
        self.r_agg_layer = ConcatenationAggregator(
            input_dim=self.input_dim_r + self.input_dim_u + self.input_dim_i,
```

```python
import matplotlib.pyplot as plt
plt.pie(df['target'].value_counts(), labels=['ham','spam'],autopct="%0.2f")
plt.show()
```

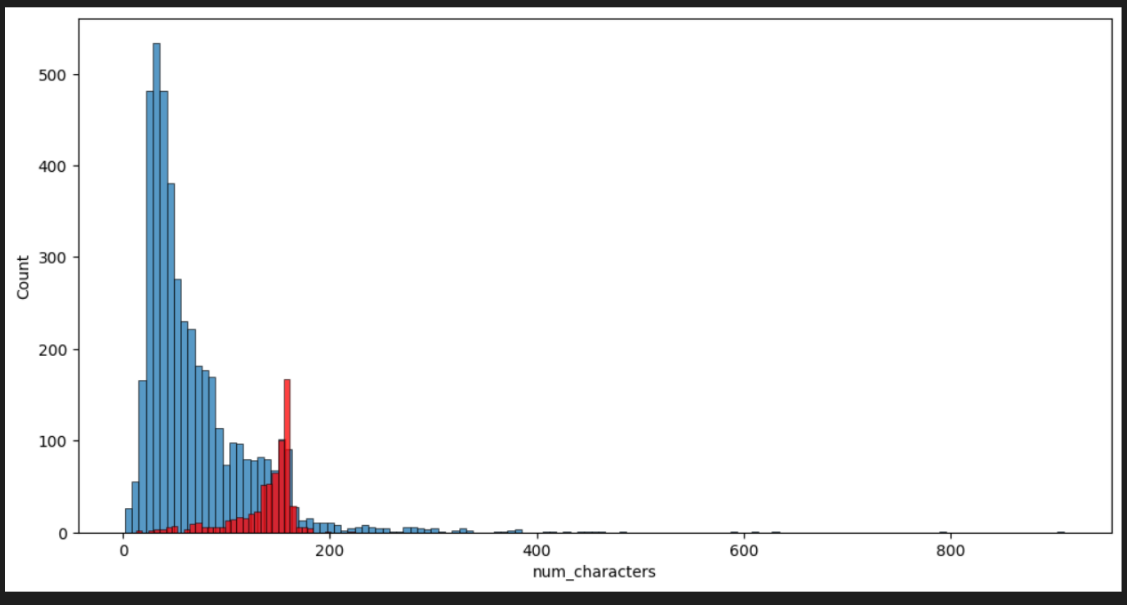
[20] ✓ 1.1s



```
plt.figure(figsize=(12,6))
sns.histplot(df[df['target'] == 0]['num_characters'])
sns.histplot(df[df['target'] == 1]['num_characters'],color='red')
```

[38] ✓ 0.9s

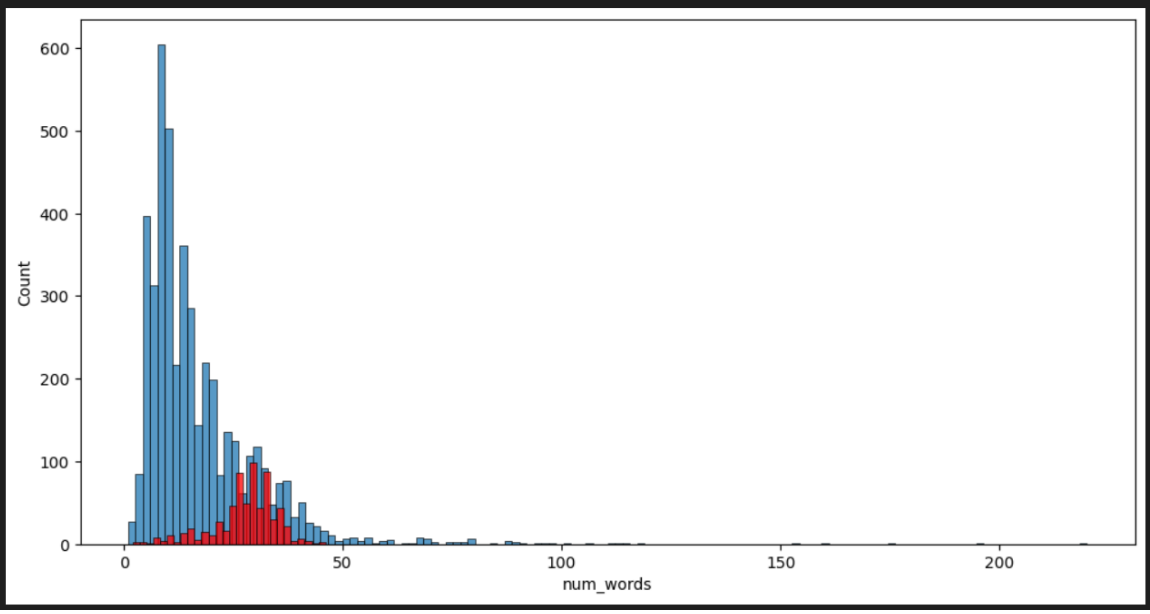
```
<Axes: xlabel='num_characters', ylabel='Count'>
```

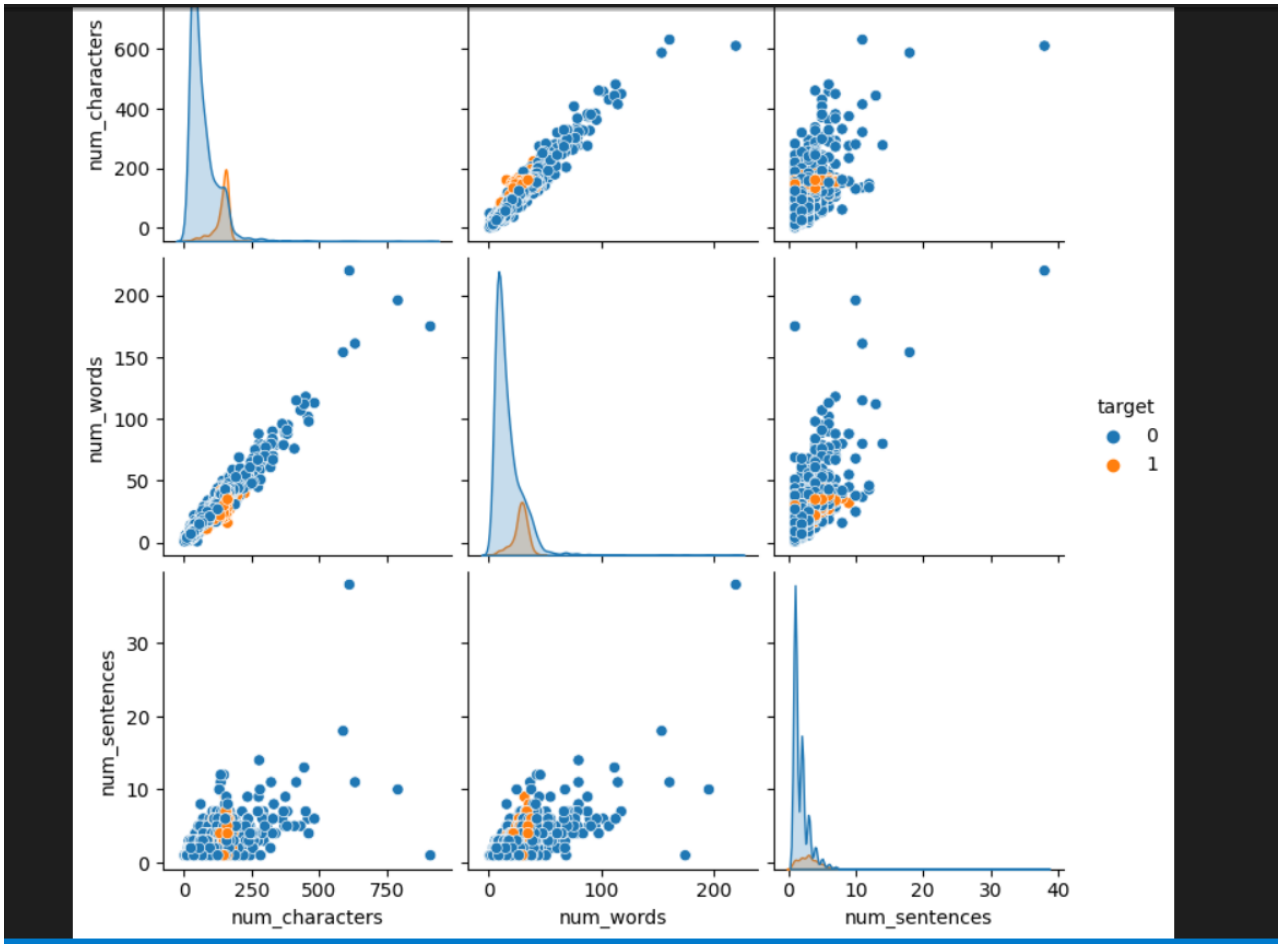



```
plt.figure(figsize=(12,6))
sns.histplot(df[df['target'] == 0]['num_words'])
sns.histplot(df[df['target'] == 1]['num_words'],color='red')
```

[39] ✓ 0.6s

```
<Axes: xlabel='num_words', ylabel='Count'>
```

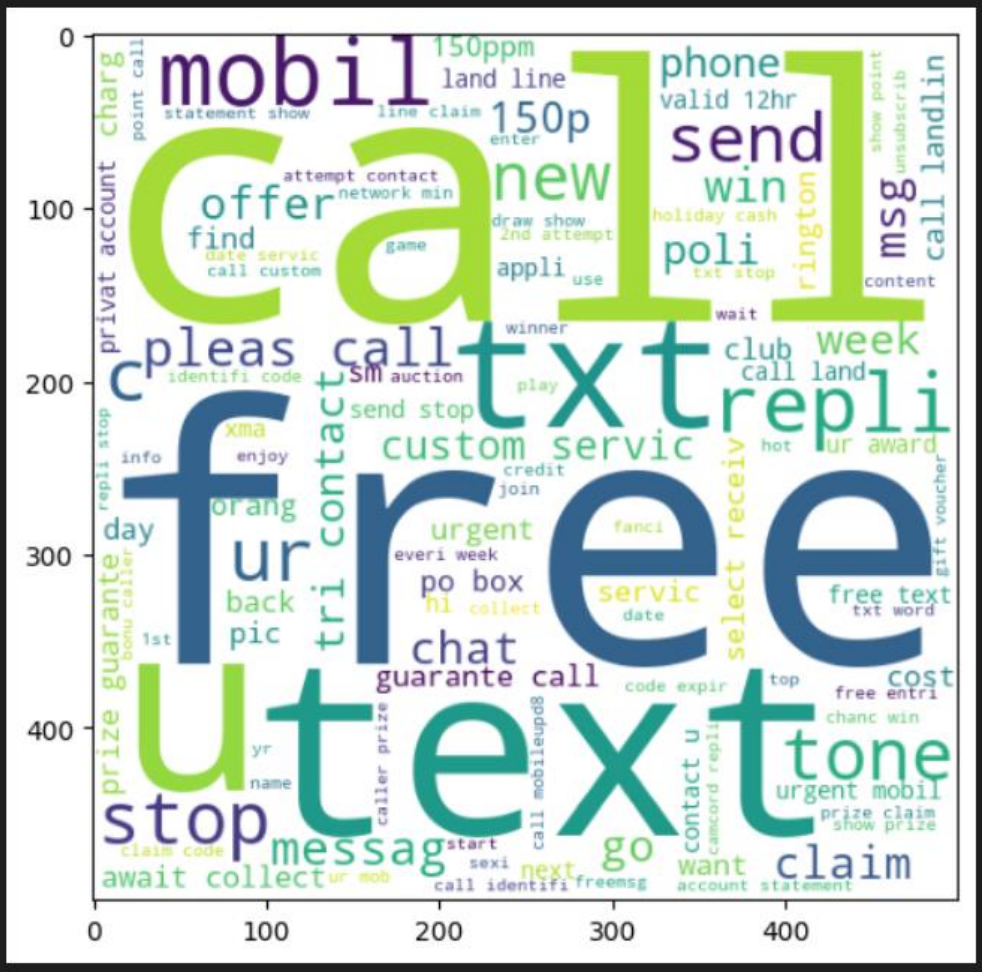



num_characters
num_words
num_sentences
target
0
1
0
250
500
750
0
100
200
0
10
20
30
40
0
200
400
600
0
50
100
150
200
0
10
20
30

```
plt.figure(figsize=(15,6))
plt.imshow(spam_wc)
```

[50] ✓ 0.3s

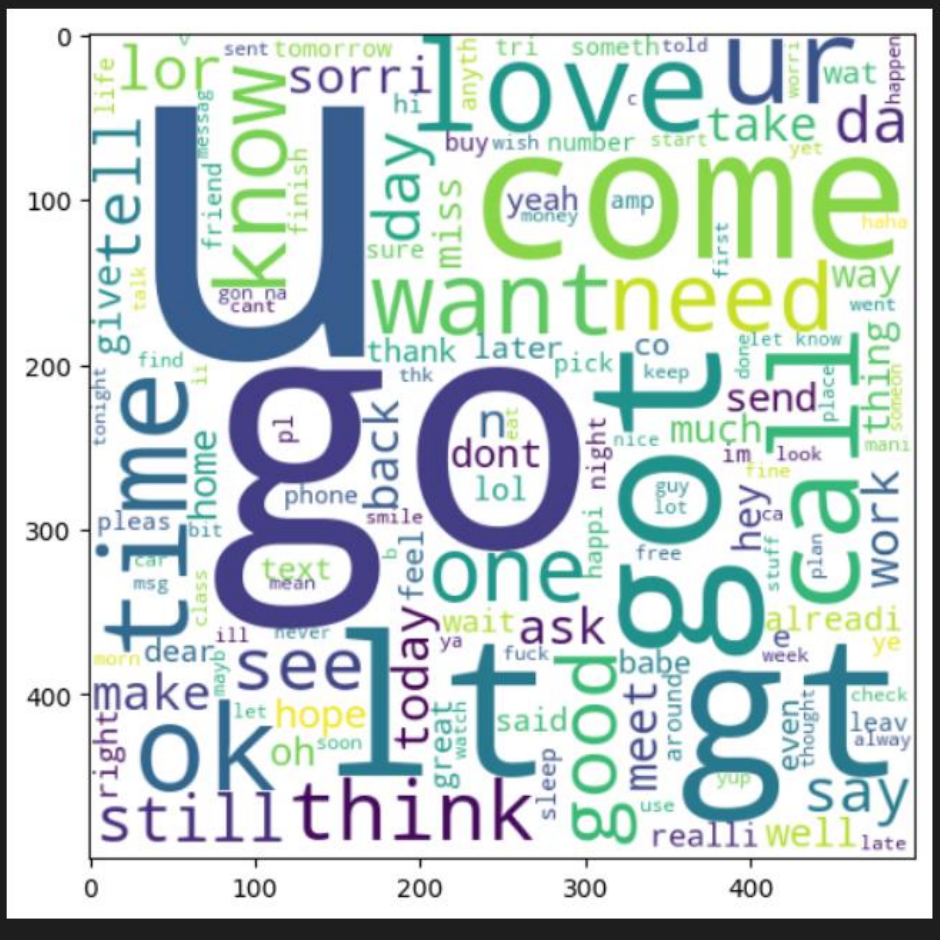
```
<matplotlib.image.AxesImage at 0x1f7efa40af0>
```



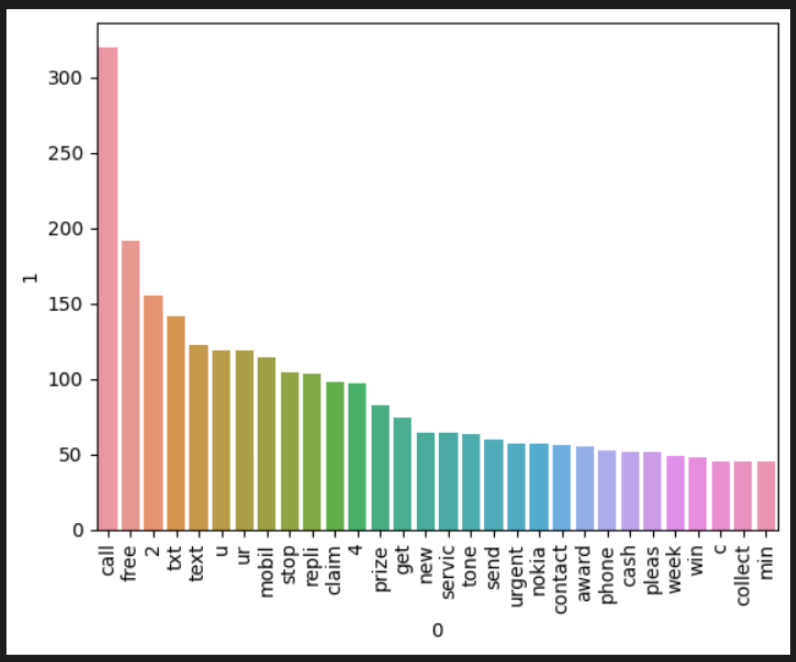
```
plt.figure(figsize=(15,6))
plt.imshow(ham_wc)
```

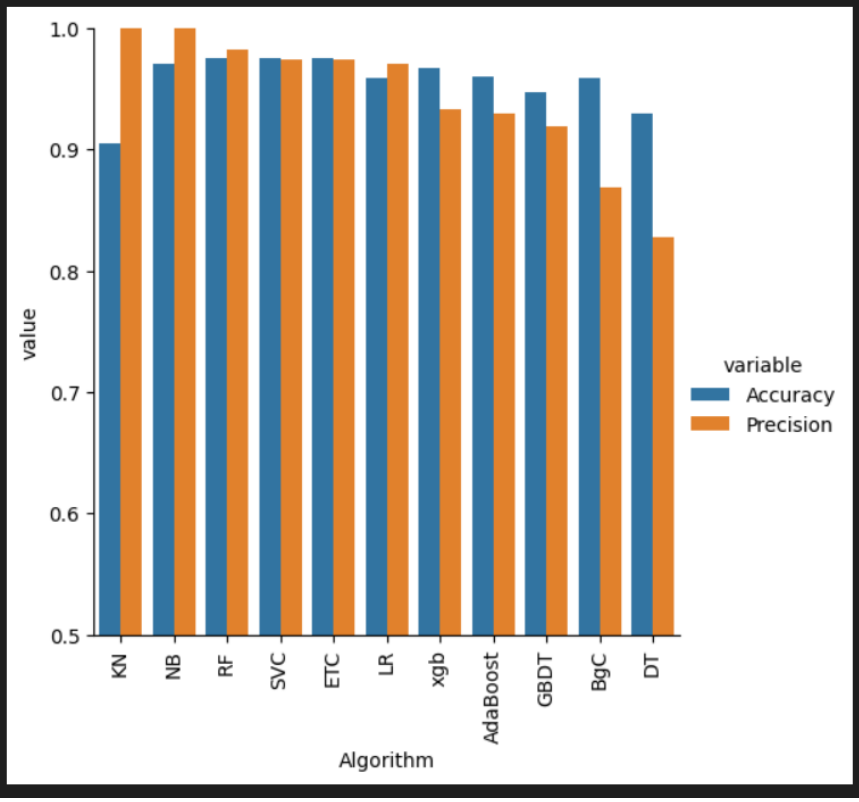
[52] ✓ 0.4s

```
<matplotlib.image.AxesImage at 0x1f7efa0c190>
```



```
Requirement already satisfied: cycler>=0.10 in c:\python3.10\lib\site-packages (from matplotlib!
Requirement already satisfied: contourpy>=1.0.1 in c:\python3.10\lib\site-packages (from matplot
Requirement already satisfied: pytz>=2017.3 in c:\python3.10\lib\site-packages (from pandas>=0.2
Requirement already satisfied: six>=1.5 in c:\python3.10\lib\site-packages (from python-dateutil
Note: you may need to restart the kernel to use updated packages.
```




```
    sns.catplot(x = 'Algorithm', y='value',
                hue = 'variable',data=performance_df1, kind='bar',height=5)
    plt.ylim(0.5,1.0)
    plt.xticks(rotation='vertical')
    plt.show()
```

[85] ✓ 0.6s