```python
import pandas as pd
import numpy as np

df = pd.read_csv('hepatitis_csv.csv')

df.head()
```

```
   age     sex steroid  antivirals fatigue malaise anorexia liver_big \
0   30    male   False       False   False   False    False     False

1   50  female   False       False    True   False    False     False

2   78  female    True       False    True   False    False      True

3   31  female     NaN        True   False   False    False      True

4   34  female    True       False   False   False    False      True


  liver_firm spleen_palpable spiders ascites varices  bilirubin \
0      False           False   False   False   False        1.0
1      False           False   False   False   False        0.9
2      False           False   False   False   False        0.7
3      False           False   False   False   False        0.7
4      False           False   False   False   False        1.0

   alk_phosphate    sgot  albumin  protime  histology class
0           85.0    18.0      4.0      NaN      False  live
1          135.0    42.0      3.5      NaN      False  live
2           96.0    32.0      4.0      NaN      False  live
3           46.0    52.0      4.0     80.0      False  live
4            NaN   200.0      4.0      NaN      False  live
```

```python
male_df = df[df['sex'] == 'male']
female_df = df[df['sex'] == 'female']

male_df.head()
```

```
     age   sex steroid  antivirals fatigue malaise anorexia liver_big \
0     30  male   False       False   False   False    False     False

20    22  male    True        True    True   False    False      True

24    25  male   False        True   False   False    False      True

27    58  male    True       False    True   False    False      True

32    41  male    True        True    True    True     True      True
```

```
    liver_firm spleen_palpable spiders ascites varices  bilirubin  \
0        False          False  False   False   False        1.0
20       False          False  False   False   False        0.9
24       False          False  False   False   False        0.4
27        True          False   True   False   False        1.4
32       False          False  False   False   False        0.7

    alk_phosphate   sgot  albumin  protime  histology class
0            85.0  18.0      4.0      NaN      False  live
20           48.0  20.0      4.2     64.0      False  live
24           45.0  18.0      4.3     70.0      False  live
27          175.0  55.0      2.7     36.0      False  live
32           81.0  53.0      5.0     74.0      False  live
```

```
female_df.head()
```

```
    age     sex steroid  antivirals fatigue malaise anorexia liver_big
\
1    50  female   False       False    True   False    False     False

2    78  female    True       False    True   False    False      True

3    31  female     NaN        True   False   False    False      True

4    34  female    True       False   False   False    False      True

5    34  female    True       False   False   False    False      True


   liver_firm spleen_palpable spiders ascites varices  bilirubin  \
1       False          False  False   False   False        0.9
2       False          False  False   False   False        0.7
3       False          False  False   False   False        0.7
4       False          False  False   False   False        1.0
5       False          False  False   False   False        0.9

    alk_phosphate    sgot  albumin  protime  histology class
1          135.0   42.0      3.5      NaN      False  live
2           96.0   32.0      4.0      NaN      False  live
3           46.0   52.0      4.0     80.0      False  live
4            NaN  200.0      4.0      NaN      False  live
5           95.0   28.0      4.0     75.0      False  live
```

```
merged_df = pd.concat([male_df, female_df], ignore_index=True)
```

```
merged_df.head()
```

```
    age    sex steroid  antivirals fatigue malaise anorexia liver_big  \
0    30   male   False       False   False   False    False     False
1    22   male    True        True    True   False    False      True
2    25   male   False        True   False   False    False      True
```

```
3   58   male      True         False      True     False      False        True
4   41   male      True          True      True      True       True        True

   liver_firm spleen_palpable spiders ascites varices  bilirubin  \
0       False            False   False   False   False        1.0
1       False            False   False   False   False        0.9
2       False            False   False   False   False        0.4
3        True            False    True   False   False        1.4
4       False            False   False   False   False        0.7

    alk_phosphate  sgot  albumin  protime  histology class
0            85.0  18.0      4.0      NaN      False  live
1            48.0  20.0      4.2     64.0      False  live
2            45.0  18.0      4.3     70.0      False  live
3           175.0  55.0      2.7     36.0      False  live
4            81.0  53.0      5.0     74.0      False  live
```

```python
sorted_df = df.sort_values(by=['age', 'sgot', 'protime'],
ascending=[True, True, True])

sorted_df.head()
```

```
      age      sex steroid  antivirals fatigue malaise anorexia
liver_big  \
110     7   female    True       False   False   False    False
True
37     20     male   False       False    True    True     True
False
121    20   female   False       False    True    True     True
True
148    20   female   False       False   False   False    False
True
20     22     male    True        True    True   False    False
True

     liver_firm spleen_palpable spiders ascites varices  bilirubin  \
110        True            True   False   False   False        0.7
37         True            True    True   False   False        2.3
121       False           False    True    True   False        1.0
148         NaN           False   False   False   False        0.9
20        False           False   False   False   False        0.9

     alk_phosphate   sgot  albumin  protime  histology class
110          256.0   25.0      4.2      NaN       True  live
37           150.0   68.0      3.9      NaN      False  live
121          160.0  118.0      2.9     23.0       True  live
148           89.0  152.0      4.0      NaN       True  live
20            48.0   20.0      4.2     64.0      False  live
```

```python
transposed_df = df.T
```

```
transposed_df.head()

                0       1       2       3       4       5       6
7    \
age            30      50      78      31      34      34      51
23
sex          male  female  female  female  female  female  female
female
steroid     False   False    True     NaN    True    True   False
True
antivirals  False   False   False    True   False   False   False
False
fatigue     False    True    True   False   False   False    True
False

                8       9     ...     145     146     147     148
149  \
age            39      30     ...      31      41      70      20
36
sex        female  female    ...  female  female  female  female
female
steroid      True    True    ...   False    True   False   False
True
antivirals  False   False    ...   False   False   False   False
False
fatigue      True   False    ...    True    True    True   False
False

                150     151     152     153     154
age            46      44      61      53      43
sex        female  female  female    male  female
steroid      True    True   False   False    True
antivirals  False   False   False   False   False
fatigue      True    True    True    True    True

[5 rows x 155 columns]

melted_df = pd.melt(df, id_vars=['age', 'sex'], var_name='Attribute',
value_name='Value')

melted_df.head()

    age       sex Attribute  Value
0    30      male   steroid  False
1    50    female   steroid  False
2    78    female   steroid   True
3    31    female   steroid    NaN
4    34    female   steroid   True

# Pivoting back to wide format based on Attribute
wide_df = melted_df.pivot_table(index=['age', 'sex'],
```

```
                                columns='Attribute',
                                values='Value',
                                aggfunc='first').reset_index()

wide_df.head()

Attribute  age      sex albumin alk_phosphate anorexia antivirals
ascites  \
0            7  female     4.2         256.0    False      False
False
1           20  female     2.9         160.0     True      False
True
2           20    male     3.9         150.0     True      False
False
3           22  female     NaN           NaN    False      False
False
4           22    male     4.2          48.0    False       True
False

Attribute bilirubin class fatigue histology liver_big liver_firm
malaise  \
0              0.7  live   False      True      True       True
False
1              1.0  live    True      True      True      False
True
2              2.3  live    True     False     False       True
True
3              0.7  live   False      True      True      False
False
4              0.9  live    True     False      True      False
False

Attribute protime    sgot spiders spleen_palpable steroid varices
0             NaN    25.0   False            True    True   False
1            23.0   118.0    True           False   False   False
2             NaN    68.0    True            True   False   False
3             NaN    24.0   False           False    True   False
4            64.0    20.0   False           False    True   False
```