TASK -3

DASHBOARD DEVELOPMENT

Data Source: Date, Product, Region, Units_Sold, Sales_Amount, Profit

2023-02-21,Laptop,South,16,40298,5579.57

2023-04-03,Tablet,North,51,43956,4754.88

2023-01-15,Laptop,South,86,15683,2098.18

2023-03-13,Laptop,North,57,1504,234.2

2023-03-02,Smartphone,West,29,34982,4736.64

2023-01-21,Tablet,East,78,35299,4156.12

2023-03-24,Headphones,West,92,29016,3601.67

2023-03-28,Headphones,North,69,24960,4796.21

2023-03-16,Smartphone,North,47,34591,4886.56

2023-03-16,Smartphone,West,94,18312,3165.3

2023-03-29,Tablet,North,62,38797,7785.92

2023-04-10,Headphones,West,69,47196,11236.37

2023-01-24,Headphones,East,76,3105,334.91

2023-01-03,Headphones,West,16,37395,9718.29

2023-01-22,Laptop,East,90,46740,10543.61

2023-02-22,Headphones,West,90,23700,2757.54

2023-01-02,Laptop,North,48,35620,9785.37

2023-03-29,Tablet,West,85,38678,10991.3

2023-01-30,Laptop,North,39,21559,2419.26

2023-02-07,Tablet,West,33,28509,4429.6

2023-01-02,Headphones,West,94,28860,7539.39

2023-03-05,Headphones,South,23,12003,2996.57

2023-03-01,Tablet,North,10,22732,3112.11

2023-01-21,Smartphone,South,69,26826,3805.8

2023-02-02,Tablet,North,34,31354,5458.56

2023-03-17,Smartphone,South,52,14843,2922.65

2023-02-27,Laptop,East,95,45472,10169.86

2023-01-22,Laptop,West,10,49529,8607.28

2023-03-30,Laptop,North,19,7190,1384.12

2023-02-18,Headphones,North,58,18640,4650.57

2023-04-01,Laptop,West,96,39413,4230.46

2023-02-28,Smartphone,North,1,43356,6524.53

2023-02-11,Laptop,North,69,45597,11065.02

2023-04-02,Tablet,South,4,41821,11669.79

2023-03-01,Tablet,North,16,4330,876.11

2023-03-21,Headphones,East,24,20087,4146.41

2023-01-15,Tablet,East,80,42430,5152.46

2023-03-03,Smartphone,West,2,25504,4832.56

2023-03-03,Laptop,North,92,8114,1675.73

2023-02-16,Headphones,West,32,14323,2126.88

2023-03-03,Laptop,East,91,35121,5403.32

2023-02-20,Laptop,North,84,11975,2101.1

2023-02-24,Smartphone,North,24,12023,1250.56

2023-03-05,Tablet,West,12,22447,3690.64

2023-01-03,Tablet,East,50,25933,3690.0

2023-02-20,Laptop,North,35,24959,4130.7

2023-01-07,Headphones,West,33,1667,206.63

2023-01-21,Tablet,East,33,30703,8538.67

2023-03-14,Headphones,West,61,10337,2260.89

2023-02-08,Tablet,South,51,47427,11184.26

2023-01-18,Headphones,North,43,37487,9665.43

2023-01-04,Smartphone,South,12,20129,4019.53

2023-03-30,Headphones,East,67,41251,4842.21

2023-03-01,Smartphone,South,65,32921,6828.52

2023-01-14,Smartphone,South,33,34307,7457.25

2023-01-09,Headphones,East,40,28355,7062.89

2023-03-31,Smartphone,West,74,38732,7217.01

2023-02-22,Laptop,South,43,5835,732.39

2023-01-02,Smartphone,West,44,21159,3316.78

2023-03-25,Tablet,South,29,39810,6871.86

2023-04-02,Headphones,West,13,48605,11139.46

2023-02-13,Tablet,East,46,14216,4226.46

2023-01-08,Tablet,South,2,36547,8082.55

2023-02-16,Tablet,East,35,32471,4787.7

2023-02-04,Smartphone,East,87,18308,2203.49

2023-03-19,Smartphone,South,81,28532,3725.48

2023-03-22,Headphones,South,90,35349,5273.77

2023-02-05,Headphones,South,8,46445,6137.07

2023-02-19,Laptop,North,93,6713,921.78

2023-01-04,Laptop,West,26,5804,911.34

2023-01-02,Headphones,North,74,11136, 1499.74

2023-01-06,Smartphone,North,90,1009,281.87

2023-02-23,Tablet,East,34,20255,2350.53
2023-01-04,Headphones,South,7,24793,5080.14
2023-02-23,Laptop,West,68,30548,5562.16
2023-04-03,Smartphone,East,58,38892,11530.53
2023-03-04,Headphones,North,75,2015,246.65
2023-01-18,Headphones,South,29,28712,5155.85
2023-03-31,Smartphone,East,36,35961,10568.73
2023-02-13,Headphones,South,89,9415,2571.25
2023-02-03,Smartphone,East,21,47318,12464.24
2023-03-15,Tablet,South,36,48280,7318.31
2023-03-03,Smartphone,North,10,24833,3332.03
2023-04-10,Smartphone,West,73,5158,1205.57
2023-01-14,Smartphone,North,24,21309,6091.71
2023-04-05,Headphones,West,64,7970,1684.48
2023-02-17,Headphones,South,99,7938,1701.29
2023-01-15,Smartphone,East,49,22168,3458.12
2023-03-13,Headphones,North,99,47540,12070.34
2023-03-19,Laptop,West,36,21384,2938.35
2023-03-28,Laptop,North,82,19017,3132.78
2023-03-03,Headphones,West,96,11344,2099.63
2023-02-09,Headphones,North,24,41034,8269.26
2023-03-26,Smartphone,West,23,9702,1440.57
2023-03-21,Tablet,West,62,1384,170.19
2023-03-23,Headphones,South,96,1404,311.86
2023-02-22,Laptop,West,37,41943,6615.51
2023-01-24,Smartphone,South,12,48926,10580.13

2023-01-26,Headphones,West,55,30189,3950.91

2023-03-30,Laptop,East,13,13763,2700.69

2023-03-01,Laptop,East,23,19384,4003.14

2023-02-10,Tablet,East,89,33606,3708.92

2023-01-29,Smartphone,West,99,10860,1817.1

2023-01-15,Smartphone,South,30,39757,5044.48

2023-02-14,Tablet,South,17,16106,1814.74

2023-03-06,Tablet,West,62,24574,7322.86

2023-03-30,Smartphone,East,84,24524,4033.48

2023-03-12,Smartphone,East,89,4636,1214.52

2023-01-09,Headphones,South,86,11916,1798.46

2023-03-29,Headphones,East,13,5809,1372.67

2023-01-01,Tablet,North,59,33201,8368.17

2023-01-08,Headphones,South,19,14456,3167.71

2023-03-29,Laptop,East,49,49212,9562.64

2023-03-04,Headphones,South,12,39765,7251.87

2023-01-11,Headphones,North,61,35816,6080.61

2023-03-22,Laptop,South,19,46106,13181.97

2023-01-08,Tablet,South,76,18100,4816.84

2023-02-04,Laptop,South,9,22949,6724.18

2023-02-04,Headphones,South,71,5544,692.22

2023-02-02,Tablet,North,28,38744,9537.75

2023-01-05,Headphones,West,78,46543,13388.94

2023-02-10,Laptop,South,95,43783,5965.29

2023-01-28,Laptop,South,52,27657,3133.52

2023-01-07,Headphones,East,83,37187,9230.71

2023-03-14,Smartphone,South,16,48198,10357.49
2023-03-13,Smartphone,East,69,8239,2211.07
2023-01-12,Laptop,West,99,15489,1981.89
2023-02-03,Laptop,North,12,44125,11430.73
2023-02-02,Smartphone,North,25,29538,4144.93
2023-02-17,Smartphone,West,52,33049,4386.63
2023-01-23,Headphones,North,85,38131,5065.82
2023-03-03,Headphones,West,53,43944,11553.53
2023-03-29,Smartphone,West,23,9427,2196.86
2023-02-06,Headphones,West,16,42348,8664.95
2023-04-09,Headphones,North,57,25285,4343.11
2023-02-13,Tablet,East,39,38626,10639.15
2023-03-27,Headphones,West,53,43808,7819.25
2023-04-01,Laptop,South,42,23928,6300.72
2023-02-04,Headphones,North,58,20198,3793.73
2023-03-06,Headphones,West,39,20758,3640.72
2023-04-09,Smartphone,West,14,16254,3129.48
2023-02-16,Laptop,South,95,45238,7250.55
2023-03-19,Headphones,East,5,2252,561.92
2023-01-03,Headphones,East,35,40764,8174.98
2023-01-01,Tablet,East,87,13173,1929.09
2023-01-05,Headphones,West,93,38441,10760.21
2023-03-31,Headphones,West,75,27698,4896.4
2023-01-14,Tablet,West,18,16781,3502.37
2023-01-27,Smartphone,North,76,14051,3952.47
2023-01-09,Headphones,South,9,40649,9139.83

2023-03-20,Tablet,West,74,7949,980.74

2023-01-15,Laptop,South,58,43289,12465.78

2023-03-31,Smartphone,South,17,9017,2033.71

2023-02-11,Laptop,East,7,7941,1326.0

2023-03-18,Laptop,North,46,26934,3443.63

2023-02-20,Tablet,West,13,24386,6311.22

2023-03-04,Headphones,East,40,11209,2510.98

2023-04-06,Tablet,East,42,18715,3868.24

2023-02-21,Tablet,West,9,29920,8341.05

2023-04-06,Tablet,South,50,32703,8428.2

2023-01-04,Tablet,East,27,43318,5645.85

2023-04-04,Smartphone,South,66,5637,915.14

2023-01-23,Headphones,North,5,5854,876.33

2023-01-15,Laptop,South,29,44088,10968.62

2023-02-12,Laptop,North,37,38660,4125.27

2023-01-29,Headphones,South,38,40811,8732.65

2023-02-05,Laptop,East,83,20856,5265.97

2023-01-13,Headphones,East,8,22833,6287.14

2023-02-01,Laptop,North,65,20963,3530.51

2023-03-12,Tablet,West,86,37932,10023.59

2023-02-28,Laptop,North,17,28169,3440.18

2023-03-27,Headphones,North,71,8941,2407.73

2023-01-28,Headphones,South,89,15388,1931.16

2023-03-07,Headphones,South,45,6569,1178.86

2023-02-11,Headphones,North,4,5300,1375.13

2023-02-14,Headphones,East,36,40037,5204.15

2023-03-03,Smartphone,South,70,37586,5481.93
2023-02-26,Smartphone,West,31,13015,3181.52
2023-01-06,Laptop,South,19,46002,11224.82
2023-01-28,Headphones,South,61,7254,1655.58
2023-01-28,Laptop,West,54,18144,4332.6
2023-02-13,Headphones,North,39,25214,5258.25
2023-03-25,Headphones,West,91,41118,6182.49
2023-01-30,Smartphone,North,74,16183,2737.18
2023-03-03,Smartphone,North,90,7238,986.68
2023-03-16,Tablet,North,19,7090,1997.18
2023-04-02,Smartphone,West,39,12637,2738.16
2023-03-30,Tablet,North,67,23415,4218.69
2023-03-03,Tablet,East,45,25071,4823.69
2023-04-07,Tablet,West,13,46415,13435.13
2023-01-01,Tablet,East,92,43679,5707.55
2023-01-27,Tablet,North,58,42240,9176.47
2023-03-03,Laptop,South,20,19271,3876.9
2023-03-18,Smartphone,North,92,37034,8232.32
2023-01-03,Tablet,East,72,34434,3568.12
2023-03-11,Headphones,East,61,5188,1423.72
2023-03-13,Smartphone,West,39,11161,3196.77
2023-01-27,Smartphone,South,1,29732,6333.71

Code for Dashboard (app.py):

```python
import dash
from dash import dcc, html
import pandas as pd
import plotly.express as px

# Load data
df = pd.read_csv('sales_data.csv')
df['Date'] = pd.to_datetime(df['Date'])

# Initialize app
app = dash.Dash(__name__)

# Layout
app.layout = html.Div([
    html.H1("📈 Sales Dashboard"),

    dcc.DatePickerRange(
        id='date-picker',
        start_date=df['Date'].min(),
        end_date=df['Date'].max()
    ),

    dcc.Dropdown(
        id='region-dropdown',
        options=[{'label': r, 'value': r} for r in df['Region'].unique()],
        value='North',
        clearable=False
    ),
```

```python
    dcc.Graph(id='sales-trend'),
    dcc.Graph(id='top-products')
])

# Callback
@app.callback(
    [dash.dependencies.Output('sales-trend', 'figure'),
     dash.dependencies.Output('top-products', 'figure')],
    [dash.dependencies.Input('date-picker', 'start_date'),
     dash.dependencies.Input('date-picker', 'end_date'),
     dash.dependencies.Input('region-dropdown', 'value')]
)
def update_graphs(start_date, end_date, region):
    dff = df[(df['Date'] >= start_date) & (df['Date'] <= end_date) & (df['Region'] == region)]

    fig1 = px.line(dff.groupby('Date').sum().reset_index(), x='Date', y='Sales_Amount', title='Sales Over Time')
    fig2 = px.bar(dff.groupby('Product').sum().reset_index(), x='Product', y='Sales_Amount', title='Top Products')

    return fig1, fig2

# Run
if __name__ == '__main__':
    app.run_server(debug=True)
```

```
# Evaluation
y_pred = model.predict(X_test)
print("Accuracy:", accuracy_score(y_test, y_pred))
print(classification_report(y_test, y_pred))
```

[6] ✓ 0.0s

```
Accuracy: 0.5166666666666667
              precision    recall  f1-score   support

           0       0.54      0.42      0.47        31
           1       0.50      0.62      0.55        29

    accuracy                           0.52        60
   macro avg       0.52      0.52      0.51        60
weighted avg       0.52      0.52      0.51        60
```

Output: