**LAPORAN AKHIR**

**PENUGASAN GOOGLE BIGQUERY DAN GOOGLE COLAB**

**DALAM PENERAN PPH DAN *TAX HOLIDAY***

Disusun untuk memenuhi tugas mata kuliah Pengkodean dan Pemrograman

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Disusun Oleh:

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**PROGRAM STUDI S-1 AKUNTANSI**

**FAKULTAS EKONOMIKA DAN BISNIS**

**UNIVERSITAS DIPONEGORO**

**2025**

1. **INSTRUKSI CHATGPT**

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1. **GOOGLE BIGQUERY**
2. Kode CSV
3. Skenario Normal

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1. Skenario *Tax Holiday*

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1. Skenario Depresiasi Garis Lurus

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1. Menginput kode ke dalam Google Bigquery

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1. Visualiasi Google Locker

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1. **GOOGLE COLAB**
2. Kode Python
3. import pandas as pd
4. import matplotlib.pyplot as plt
5. from mpl\_toolkits.mplot3d import Axes3D
6. import numpy as np
7. # Data CSV langsung dimasukkan sebagai string untuk kemudahan di Colab
8. transaksi\_data = """tahun,pendapatan,beban\_operasional,penyusutan,skenario
9. 2020,12000000000,5000000000,800000000,normal
10. 2020,12500000000,5200000000,850000000,tax\_holiday
11. 2020,11800000000,5100000000,900000000,depresiasi\_perbandingan
12. 2021,13000000000,5300000000,880000000,normal
13. 2021,13500000000,5400000000,920000000,tax\_holiday
14. 2021,12900000000,5200000000,870000000,depresiasi\_perbandingan
15. 2022,12800000000,5500000000,860000000,normal
16. 2022,13300000000,5600000000,870000000,tax\_holiday
17. 2022,12600000000,5300000000,890000000,depresiasi\_perbandingan
18. 2023,14000000000,6000000000,950000000,normal
19. 2023,14500000000,6100000000,940000000,tax\_holiday
20. 2023,13800000000,5900000000,910000000,depresiasi\_perbandingan
21. 2024,14200000000,6050000000,970000000,normal
22. 2024,14700000000,6150000000,960000000,tax\_holiday
23. 2024,13900000000,5950000000,930000000,depresiasi\_perbandingan
24. 2025,14400000000,6100000000,980000000,normal
25. 2025,14800000000,6200000000,970000000,tax\_holiday
26. 2025,14000000000,6000000000,940000000,depresiasi\_perbandingan"""
27. aset\_data = """aset\_id,kategori,nilai\_perolehan,umur\_ekonomis,metode
28. 1,mesin,1500000000,8,garis\_lurus
29. 2,bangunan,2000000000,10,saldo\_menurun
30. 3,kendaraan,800000000,5,garis\_lurus
31. 4,mesin,1200000000,7,saldo\_menurun
32. 5,bangunan,1700000000,10,garis\_lurus
33. 6,kendaraan,900000000,5,saldo\_menurun
34. 7,mesin,1000000000,6,garis\_lurus
35. 8,bangunan,1800000000,10,saldo\_menurun
36. 9,kendaraan,850000000,5,garis\_lurus
37. 10,mesin,1100000000,7,saldo\_menurun"""
38. kebijakan\_data = """tahun,tax\_rate,tax\_holiday\_awal,tax\_holiday\_akhir
39. 2020,0.22,,
40. 2021,0.22,,
41. 2022,0.22,,
42. 2023,0.22,2023,2027
43. 2024,0.22,2023,2027
44. 2025,0.22,2023,2027"""
45. # Membaca data dari string CSV
46. from io import StringIO
47. transaksi\_df = pd.read\_csv(StringIO(transaksi\_data))
48. aset\_df = pd.read\_csv(StringIO(aset\_data))
49. kebijakan\_df = pd.read\_csv(StringIO(kebijakan\_data))
50. # 1. Simulasi Laba Kotor
51. transaksi\_df['laba\_kotor'] = transaksi\_df['pendapatan'] - (transaksi\_df['beban\_operasional'] + transaksi\_df['penyusutan'])
52. # 2. Simulasi Depresiasi
53. aset\_df['depresiasi\_tahunan'] = aset\_df.apply(
54. lambda row: row['nilai\_perolehan'] / row['umur\_ekonomis'] if row['metode'] == 'garis\_lurus'
55. else row['nilai\_perolehan'] \* 0.25, axis=1)
56. # 3. Simulasi PPh Badan
57. def hitung\_pph(row, kebijakan\_df):
58. kebijakan = kebijakan\_df[kebijakan\_df['tahun'] == row['tahun']]
59. if not kebijakan.empty:
    1. tax\_holiday\_awal = kebijakan['tax\_holiday\_awal'].iloc[0]
    2. tax\_holiday\_akhir = kebijakan['tax\_holiday\_akhir'].iloc[0]
    3. if pd.notna(tax\_holiday\_awal) and row['tahun'] >= tax\_holiday\_awal and row['tahun'] <= tax\_holiday\_akhir:
       1. return 0
    4. return row['laba\_kotor'] \* kebijakan['tax\_rate'].iloc[0]
60. return row['laba\_kotor'] \* 0.22
61. pph\_df = transaksi\_df[transaksi\_df['skenario'] == 'normal'].copy()
62. pph\_df['pph\_badan\_normal'] = pph\_df.apply(lambda row: row['laba\_kotor'] \* 0.22, axis=1)
63. pph\_df['pph\_badan\_tax\_holiday'] = pph\_df.apply(lambda row: hitung\_pph(row, kebijakan\_df), axis=1)
64. # Visualisasi 1: Laba Kotor per Skenario (3D Bar Chart)
65. fig = plt.figure(figsize=(12, 8))
66. ax = fig.add\_subplot(111, projection='3d')
67. # Data untuk visualisasi
68. tahun = sorted(transaksi\_df['tahun'].unique())
69. skenario\_list = ['normal', 'tax\_holiday', 'depresiasi\_perbandingan']
70. bar\_width = 0.25
71. x\_pos = np.arange(len(tahun))
72. for idx, skenario in enumerate(skenario\_list):
73. laba\_kotor = [transaksi\_df[(transaksi\_df['tahun'] == t) & (transaksi\_df['skenario'] == skenario)]['laba\_kotor'].iloc[0] / 1e9 for t in tahun]
74. ax.bar(x\_pos + idx \* bar\_width, laba\_kotor, zs=idx, zdir='y', width=bar\_width, label=skenario)
75. ax.set\_xlabel('Tahun')
76. ax.set\_ylabel('Skenario')
77. ax.set\_zlabel('Laba Kotor (Miliar IDR)')
78. ax.set\_xticks(x\_pos + bar\_width)
79. ax.set\_xticklabels(tahun)
80. ax.set\_yticks([0, 1, 2])
81. ax.set\_yticklabels(skenario\_list)
82. ax.set\_title('Tren Laba Kotor per Skenario')
83. plt.legend()
84. plt.show()
85. # Visualisasi 2: PPh Badan (3D Bar Chart)
86. fig = plt.figure(figsize=(12, 8))
87. ax = fig.add\_subplot(111, projection='3d')
88. pph\_normal = pph\_df['pph\_badan\_normal'] / 1e9
89. pph\_tax\_holiday = pph\_df['pph\_badan\_tax\_holiday'] / 1e9
90. ax.bar(x\_pos, pph\_normal, zs=0, zdir='y', width=bar\_width, label='Normal')
91. ax.bar(x\_pos + bar\_width, pph\_tax\_holiday, zs=1, zdir='y', width=bar\_width, label='Tax Holiday')
92. ax.set\_xlabel('Tahun')
93. ax.set\_ylabel('Skenario PPh')
94. ax.set\_zlabel('PPh Badan (Miliar IDR)')
95. ax.set\_xticks(x\_pos + bar\_width/2)
96. ax.set\_xticklabels(tahun)
97. ax.set\_yticks([0, 1])
98. ax.set\_yticklabels(['Normal', 'Tax Holiday'])
99. ax.set\_title('Perbandingan PPh Badan')
100. plt.legend()
101. plt.show()
102. # Visualisasi 3: Depresiasi per Kategori (3D Bar Chart)
103. fig = plt.figure(figsize=(12, 8))
104. ax = fig.add\_subplot(111, projection='3d')
105. kategori\_list = aset\_df['kategori'].unique()
106. metode\_list = ['garis\_lurus', 'saldo\_menurun']
107. x\_pos = np.arange(len(kategori\_list))
108. for idx, metode in enumerate(metode\_list):
109. depresiasi = [aset\_df[(aset\_df['kategori'] == k) & (aset\_df['metode'] == metode)]['depresiasi\_tahunan'].sum() / 1e6 for k in kategori\_list]
110. ax.bar(x\_pos + idx \* bar\_width, depresiasi, zs=idx, zdir='y', width=bar\_width, label=metode)
111. ax.set\_xlabel('Kategori Aset')
112. ax.set\_ylabel('Metode Depresiasi')
113. ax.set\_zlabel('Depresiasi (Juta IDR)')
114. ax.set\_xticks(x\_pos + bar\_width/2)
115. ax.set\_xticklabels(kategori\_list)
116. ax.set\_yticks([0, 1])
117. ax.set\_yticklabels(metode\_list)
118. ax.set\_title('Depresiasi per Kategori Aset')
119. plt.legend()
120. plt.show()
121. # Menyimpan hasil analisis ke CSV
122. laba\_kotor\_df = transaksi\_df[['tahun', 'skenario', 'laba\_kotor']].pivot(index='tahun', columns='skenario', values='laba\_kotor')
123. pph\_df[['tahun', 'pph\_badan\_normal', 'pph\_badan\_tax\_holiday']].to\_csv('pph\_badan.csv', index=False)
124. aset\_df[['aset\_id', 'kategori', 'metode', 'depresiasi\_tahunan']].to\_csv('depresiasi.csv', index=False)
125. # Ringkasan
126. print("Ringkasan Analisis:")
127. print(f"- Laba kotor tertinggi pada 2025 (tax\_holiday): {transaksi\_df[transaksi\_df['skenario'] == 'tax\_holiday']['laba\_kotor'].max() / 1e9:.2f} Miliar IDR")
128. print(f"- Penghematan PPh terbesar pada 2025 (tax\_holiday): {pph\_df['pph\_badan\_normal'].max() / 1e9:.2f} Miliar IDR")
129. print("- Depresiasi tertinggi pada metode saldo menurun untuk bangunan.")
130. Visualiasi Kode

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