Step-by-Step Guide: Analyzing Paycheck Deductions with pandas

## Step 1: Install Required Libraries

Use pip to install pandas, openpyxl, and xlsxwriter:  
  
pip install pandas openpyxl xlsxwriter

## Step 2: Load the Excel File

Use pandas to load the Excel file containing paycheck data:  
  
df = pd.read\_excel("paycheck\_report.xlsx", engine='openpyxl', parse\_dates=["Paycheck Issue Date"])

## Step 3: Detect Missing Paycheck Dates

Assume a biweekly frequency (14 days). Generate the full range of expected dates and find missing ones:  
  
full\_date\_range = pd.date\_range(start=df["Paycheck Issue Date"].min(), end=df["Paycheck Issue Date"].max(), freq='14D')  
existing\_dates = pd.to\_datetime(df["Paycheck Issue Date"].unique())  
missing\_dates = full\_date\_range.difference(existing\_dates)

## Step 4: Insert Missing Rows

Create placeholder rows for the missing dates and flag them:  
  
missing\_rows = pd.DataFrame({"Paycheck Issue Date": missing\_dates, "Is\_Missing": True})  
df["Is\_Missing"] = False  
combined\_df = pd.concat([df, missing\_rows], ignore\_index=True).sort\_values("Paycheck Issue Date")

## Step 5: Export to Excel with Background Color on Missing Rows

Use xlsxwriter to save the styled Excel file:  
  
with pd.ExcelWriter("processed\_paycheck\_report.xlsx", engine='xlsxwriter') as writer:  
 combined\_df.to\_excel(writer, sheet\_name='Data', index=False)  
 workbook = writer.book  
 worksheet = writer.sheets['Data']  
 highlight\_format = workbook.add\_format({'bg\_color': '#FFCCCC'})  
 for row\_num, is\_missing in enumerate(combined\_df['Is\_Missing'], start=1):  
 if is\_missing:  
 worksheet.set\_row(row\_num, cell\_format=highlight\_format)

## Step 6: Optional - Create Pivot Table

Generate a pivot-style summary in a new sheet:  
  
pivot\_df = combined\_df[~combined\_df["Is\_Missing"]].pivot\_table(  
 index="Employee",  
 columns="Plan Type",  
 values="Deduction Amount",  
 aggfunc="sum",  
 fill\_value=0  
)  
pivot\_df.to\_excel(writer, sheet\_name="Pivot Summary")