

PDF Generation Logic (enhanced_invoice.py)

1. Executive Summary

Implements the programmatic generation of PDF invoices using the ReportLab library.

2. Code Logic & Functionality

1. **Canvas Setup:** Creates a PDF canvas in memory using `io.BytesIO`.
2. **Layout Design:** Defines the physical layout of elements (Logo, Table, Footer) using absolute coordinates or flowables.
3. **Content Rendering:** Iterates through booking data to populate the itemized table.
4. **Output:** Returns the raw PDF bytes to be sent to the user's browser.

3. Key Concepts & Definitions

- **ReportLab:** An open-source library for creating PDFs in Python.
- **Flowable:** An element (paragraph, table) that can 'flow' across pages.
- **Buffer:** A temporary memory space used to store the PDF before saving.

4. Location Details

Path: enhanced_invoice.py **Type:** .PY File

5. Source Code Preview (Snippet)

Running typical software analysis on this file:

```
"""
Enhanced PDF Invoice Generator with Professional Branding
Includes school logo, QR code, better layout, and terms
"""

from reportlab.lib.pagesizes import letter
from reportlab.lib import colors
from reportlab.platypus import SimpleDocTemplate, Table, TableStyle, Pa
from reportlab.lib.styles import getSampleStyleSheet, ParagraphStyle
from reportlab.lib.units import inch
from reportlab.graphics.shapes import Drawing, Rect
from reportlab.graphics.barcode.qr import QrCodeWidget
from reportlab.graphics import renderPDF
from io import BytesIO
from datetime import datetime

def create_school_logo(width=200):
    """Create a simple SVG-style logo using ReportLab graphics"""
    from reportlab.graphics.shapes import Drawing, Circle, String, Poly
```

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d = Drawing(width, 80)

# School icon (simplified building)
d.add(Polygon(points=[40,60, 60,40, 80,60], fillColor=colors.HexColor('#0056A3')))
d.add(Rect(45, 30, 30, 30, fillColor=colors.HexColor('#0056A3')))
d.add(Rect(50, 35, 8, 10, fillColor=colors.white))
d.add(Rect(67, 35, 8, 10, fillColor=colors.white))

# Text
d.add(String(100, 50, 'GREENWOOD', fontSize=18, fontName='Helvetica',
            fillColor=colors.HexColor('#002E5D')))
d.add(String(100, 35, 'International School', fontSize=10, fontName='Helvetica',
            fillColor=colors.HexColor('#0DA49F')))

return d

def create_qr_code(booking_id):
    """Create QR code for invoice verification"""
    qr_code = QrCodeWidget(f'https://greenwood.edu.uk/invoice/{booking_id}')
    d = Drawing(80, 80)
    d.add(qr_code)
    return d

def generate_professional_invoice(booking):
    """Generate enhanced PDF invoice with branding"""
    buffer = BytesIO()
    doc = SimpleDocTemplate(
        buffer,
        pagesize=letter,
        topMargin=0.75*inch,
        bottomMargin=0.75*inch,
        leftMargin=0.75*inch,
        rightMargin=0.75*inch
    )

    elements = []
    styles = getSampleStyleSheet()

    # Custom Styles
    header_style = ParagraphStyle(
        'HeaderStyle',
        parent=styles['Heading1'],
        fontSize=32,
        textColor=colors.HexColor('#002E5D'),
        spaceAfter=5,
        fontName='Helvetica-Bold'
    )

    subtitle_style = ParagraphStyle(
        'SubtitleStyle',
        parent=styles['Normal'],
        fontSize=11,

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        textColor=colors.HexColor('#0DA49F'),
        spaceAfter=20,
        fontName='Helvetica-Bold'
    )

section_heading = ParagraphStyle(
    'SectionHeading',
    parent=styles['Heading2'],
    fontSize=14,
    textColor=colors.HexColor('#002E5D'),
    spaceAfter=10,
    spaceBefore=15,
    fontName='Helvetica-Bold',
    borderPadding=5,
    backColor=colors.HexColor('#F8F9FA')
)

body_text = ParagraphStyle(
    'BodyText',
    parent=styles['Normal'],
    fontSize=10,
    textColor=colors.HexColor('#333333')
)

# === Header with Logo ===
logo_table = Table([[create_school_logo(), '']], colWidths=[250, 20
logo_table.setStyle(TableStyle([
    ('VALIGN', (0, 0), (-1, -1), 'TOP'),
]))
elements.append(logo_table)
elements.append(Spacer(1, 20))

# === INVOICE Title ===
elements.append(Paragraph("INVOICE", header_style))
elements.append(Paragraph("Activity Booking Confirmation", subtitle
elements.append(Spacer(1, 10))

# === Colored Header Bar ===
header_bar = Table([['']], colWidths=[450])
header_bar.setStyle(TableStyle([
    ('BACKGROUND', (0, 0), (-1, -1), colors.HexColor('#0DA49F')),
    ('LINEABOVE', (0, 0), (-1, -1), 3, colors.HexColor('#002E5D')),
]))
elements.append(header_bar)
elements.append(Spacer(1, 20))

# === Invoice Info and QR Code ===
invoice_info_data = [
    ['Invoice Number:', f'GRN-{booking.id:06d}', '', create_qr_code
    ['Invoice Date:', datetime.now().strftime('%d %B %Y'), '', ''],
    ['Payment Status:', 'PAID ✓', '', ''],
    ['Transaction ID:', f'TXN-{booking.id}-{datetime.now().strftime
]

```

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invoice_info_table = Table(invoice_info_data, colWidths=[120, 200,
invoice_info_table.setStyle(TableStyle([
    ('FONTNAME', (0, 0), (0, -1), 'Helvetica-Bold'),
    ('FONTSIZE', (0, 0), (-1, -1), 10),
    ('TEXTCOLOR', (0, 0), (0, -1), colors.HexColor('#555555'))),
    ('VALIGN', (0, 0), (-1, -1), 'TOP'),
    ('SPAN', (3, 0), (3, 2)),
    ('ALIGN', (3, 0), (3, 3), 'CENTER'),
    ('FONTSIZE', (3, 3), (3, 3), 7),
    ('TEXTCOLOR', (3, 3), (3, 3), colors.grey),
    ('BOTTOMPADDING', (0, 0), (-1, -1), 6),
]))
elements.append(invoice_info_table)
elements.append(Spacer(1, 25))

# === Bill To Section ===
elements.append(Paragraph("Bill To", section_heading))

bill_to_data = [
    ['Parent/Guardian:', booking.parent.full_name],
    ['Email:', booking.parent.email],
    ['Phone:', booking.parent.phone or 'N/A'],
    ['Student:', f'{booking.child.name} (Year {booking.child.grade})']
]

...
... [Code Truncated for Documentation Readability - See Source File for
```