

Project: Bills/Invoices layout detection

1. Overview

You have already gathered (or generated) a dataset of bills/invoices in **Assignment 1**. Now, you will:

1. **Label** these documents using [LabelMe](#).
 2. **Train** a YOLOv11 model with your labeled data.
 3. **Test** your model on unseen images on the testing day.
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2. Bill Types & Labeling Requirements

From **Assignment 1**, you chose either:

- **Complete Bills** (Images: ~100 or more)
- **Partial Tax Invoices** (Images: ~200 or more)

You may generate or gather additional bills to reach the required minimum number of labeled images per person. **Remember:** one “labeled image” means you have drawn **all** relevant bounding boxes in that image.

2.1. Complete Bills

If you are working with **Complete Bills**:

1. **Minimum: 100 labeled images** (per person) suggested. You can go beyond 100 for better training results (e.g., 200 images for my testing project).
2. **Classes to Label** in each bill:
 - **Buyer Name**
 - ชื่อผู้ซื้อก咽าไทย (buyer_name_thai)
 - ชื่อผู้ซื้อก咽าอังกฤษ (buyer_name_eng)
 - Note: If the bill shows only an English name, label only buyer_name_eng. If it only has a Thai name, label only buyer_name_thai.
 - **Seller Name**
 - ชื่อผู้ขาย咽าไทย (seller_name_thai)
 - ชื่อผู้ขาย咽าอังกฤษ (seller_name_eng)
 - Note: Same logic as buyer name. Label only the language that appears.
 - **Buyer VAT Number**
 - หมายเลข咽าผู้ซื้อ (buyer_vat_number)
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- **Seller VAT Number**
 - หมายเลขภาษีผู้ขาย (seller_vat_number)
- **Total Due Amount**
 - ยอดรวมสุทธิ (total_due_amount)

Note: If the bill shows only an English name, label only buyer_name_eng. If it only has a Thai name, label only buyer_name_thai.

2.2. Partial Tax Invoices

If you chose **Partial Tax Invoices**:

1. **Minimum:** The original assignment suggested ~200 partial invoices, but the exact number depends on your group size or personal goals (see Section 4). You can gather additional bills or create them to reach your target.
2. **Classes to Label** in each invoice:
 - **Seller Name**
 - ชื่อผู้ขายภาษาไทย (seller_name_thai)
 - ชื่อผู้ขายภาษาอังกฤษ (seller_name_eng)
 - *Note:* Label whichever name(s) appear.
 - **Seller VAT Number**
 - หมายเลขภาษีผู้ขาย (seller_vat_number)
 - **Document Date**
 - วันที่ของเอกสาร (Doc_date)
 - **Table Details** (break down at least into):
 - จำนวนสินค้า (quantity_item)
 - คำอธิบายสินค้า (product_description)
 - ราคาสินค้า (price)
 - **Total Due Amount**
 - ยอดรวมสุทธิ (total_due_amount)

3. Individual vs. Group Work

- **Individual:** Must label **at least** 100 images if working on Complete Bills, or about 200 images if working on Partial Tax Invoices (or an agreed-upon equivalent).
- **Groups of 2:** You should **double** the per-person requirement.
- **Groups of 3:** **Triple** the per-person requirement.

Example: In a group of three handling Complete Bills, the total labeled images should be at least 300 (or more if you want better model performance).

4. Labeling Using LabelMe

1. **Installation:**
 - o Download [LabelMe](#) and install it.
 2. **Creating Labels:**
 - o Open each bill image in LabelMe.
 - o Draw bounding boxes around each required text field (e.g., buyer_name_thai, seller_vat_number, etc.).
 - o Save the .json file for each image.
 - o Each image with its all bounding boxes **counts as 1 labeled image**.
 3. **Accuracy:**
 - o Ensure bounding boxes fit the text fields properly.
 - o Use **consistent class names** exactly as specified.
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5. Data Augmentation

- **Enhance** your dataset by applying augmentations (e.g., rotation, perspective transform, brightness/contrast changes) to help your model generalize better.
 - **Document** what augmentations you chose and **why** you chose them.
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6. Model Training

Train your YOLOv11 model using your labeled dataset. In your **report** (optional but recommended):

1. **Example Image + Annotation:** Show a sample annotated bill and the corresponding LabelMe bounding boxes.
2. **Training Command & Screenshot:** Show how you launched the training (e.g., hyperparameters, command line).
3. **Hyperparameters:**
 - o Number of epochs, learning rate, batch size, image size, etc.
 - o Number of training vs. validation images.
4. **Training Graphs:**
 - o Loss curve, mAP (mean average precision), precision, recall, etc.
 - o Briefly explain each graph (you can use large language models to help with the explanation).
5. **Performance vs. Reality:**
 - o Compare final metrics to how the model performs on real, unseen test bills.

7. Testing & Scoring

- On the testing day, you will run your trained model on **unseen** bills.
 - You earn **1 point** for each correctly identified and labeled field in a test image.
 - If your model **correctly identifies all fields** on all test images, you receive **full score** for this project automatically.
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8. Additional Tools (Not need, I using LabelMe on my testing project)

1. **Tool #1** (to be announced):
 - You will need to **create a username & password** (nothing sensitive, just easy to remember) so I can grant you access.
 2. **Tool #2** (optional - [Azure Document Intelligence](#)):
 - Register if you want advanced labeling or OCR-based solutions.
 - I will provide an API integration guide later.
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9. Submission

1. **Labels & Images:**
 - Save all labeled images (in .jpg, .png, or .pdf) **plus** the corresponding .json files from LabelMe.
 - Compress them into one .zip file.
 2. **Model File & Report:**
 - Include your final YOLOv11 weights (e.g., best.pt) and your brief report (PDF or Word).
 3. **Upload:**
 - Upload everything to Google Drive or OneDrive.
 - Share the link for grading.
 4. **Group Work:**
 - One submission per group, specifying each member's contribution.
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10. Deadlines & Communication

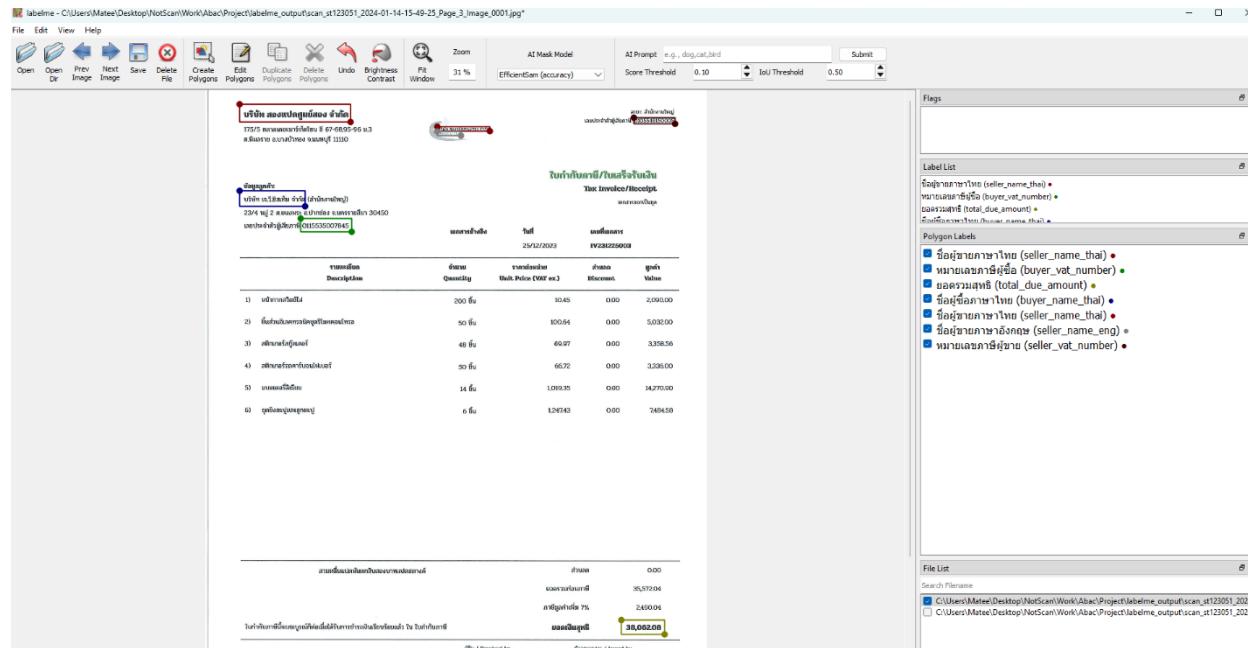
- If you need more time, let me know **in class** or via message.
 - Ask **any questions** early to avoid confusion.
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Final Notes & Recommendations

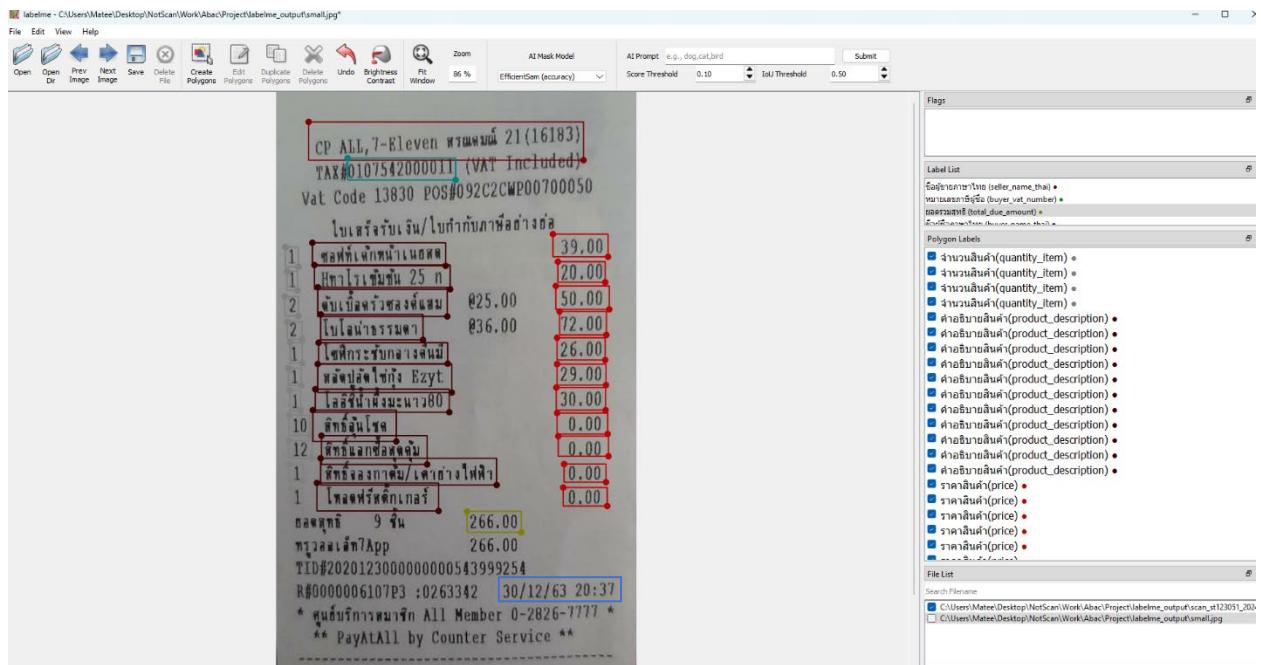
1. You must have **at least** 100 labeled images (Complete Bills) or ~200 labeled images (Partial Invoices) per person, or the equivalent if you're in a group.
2. Feel free to **generate or locate more data** (as per Assignment 1) to improve your training set.
3. **Data augmentation** is strongly recommended.
4. Provide **example** labeled images in your report so I can see how accurately you're drawing bounding boxes.
5. **Be prepared** on testing day with your final model.

Good luck, and happy labeling!

Example labeling Complete Bills



Example labeling Partial Tax Invoices



Example full classes

"ชื่อผู้ซื้อภาษาไทย (buyer_name_thai)",
"ชื่อผู้ซื้อภาษาอังกฤษ (buyer_name_eng)",
"สาขาผู้ซื้อ (buyer_branch)",
"ที่อยู่ผู้ซื้อภาษาไทย (buyer_address_thai)",
"ที่อยู่ผู้ซื้อภาษาอังกฤษ (buyer_address_eng)",
"หมายเลขภาษีผู้ซื้อ (buyer_vat_number)",
"ชื่อผู้ขายภาษาไทย (seller_name_thai)",
"ชื่อผู้ขายภาษาอังกฤษ (seller_name_eng)",
"สาขาผู้ขาย (seller_branch)",
"ที่อยู่ผู้ขายภาษาไทย (seller_address_thai)",
"ที่อยู่ผู้ขายภาษาอังกฤษ (seller_address_eng)",
"หมายเลขภาษีผู้ขาย (seller_vat_number)",
"ประเภทเอกสาร (Document type)",
"หมายเลขใบเอกสาร (Doc_number)",
"วันที่ของเอกสาร (Doc_date)",
"ตาราง (Table)",
"จำนวนเงินส่วนลด (discount_amount)",
"ยอดรวมส่วนลด (amount_after_discount)",
"ยอดรวมก่อนภาษี (sub_total)",
"เบอร์เซ็นต์ภาษีหัก ณ ที่จ่าย (WHT_%)",

"จำนวนเงินภาษีหัก ณ ที่จ่าย (WHT_amount)",
"เบอร์เรชั่นต์ภาษีมูลค่าเพิ่ม (vat_%)",
"จำนวนเงินภาษีมูลค่าเพิ่ม (vat_amount)",
"ยอดรวมสุทธิ (total_due_amount)",
"ยอดรวมตัวอักษร (text_amount)",
"สกุลเงิน (currency)",
"อัตราแลกเปลี่ยน (exchange_rate)",
"เบอร์แฟกซ์ผู้ขาย (seller_fax_number)",
"เบอร์แฟกซ์ผู้ซื้อ (buyer_fax_number)",
"เบอร์โทรศัพท์ผู้ขาย (seller_phone)",
"เบอร์โทรศัพท์ผู้ซื้อ (buyer_phone)",
"รหัสลูกค้า (client_id)",
"วันครบกำหนดชำระเงิน (payment_due_date)",
"หมายเลขคำสั่งซื้อ (po_number)",
"อีเมลผู้ขาย (seller_email)",
"เว็บไซต์ผู้ขาย (seller_website)",
"ที่อยู่จัดส่งสินค้า (shipto_address)",
"รหัสสินค้า (product_code)",