Software Architecture — Project Assignment

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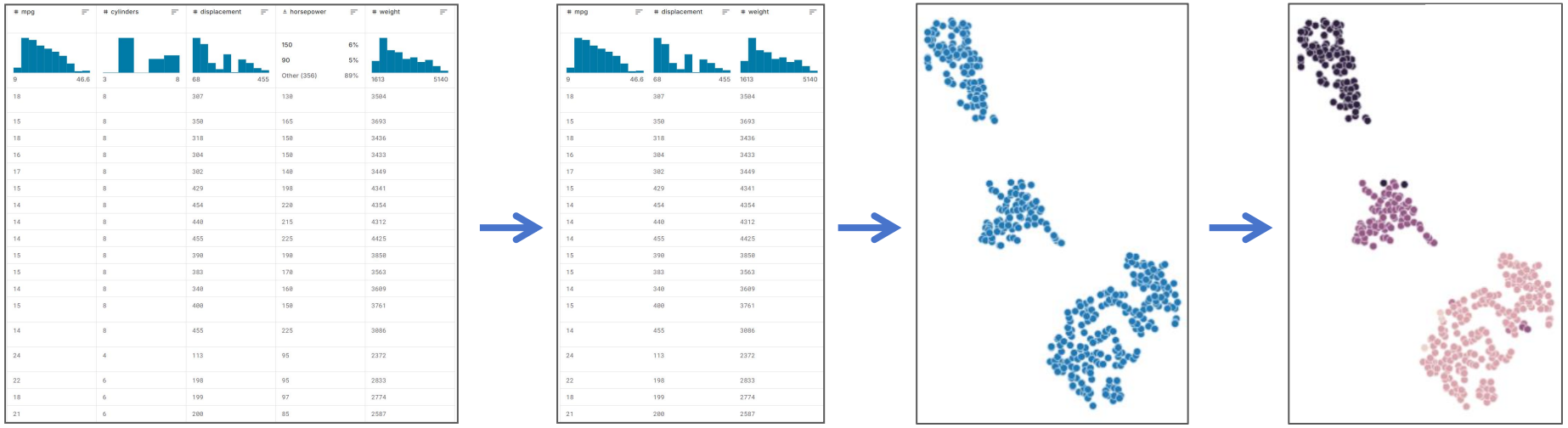
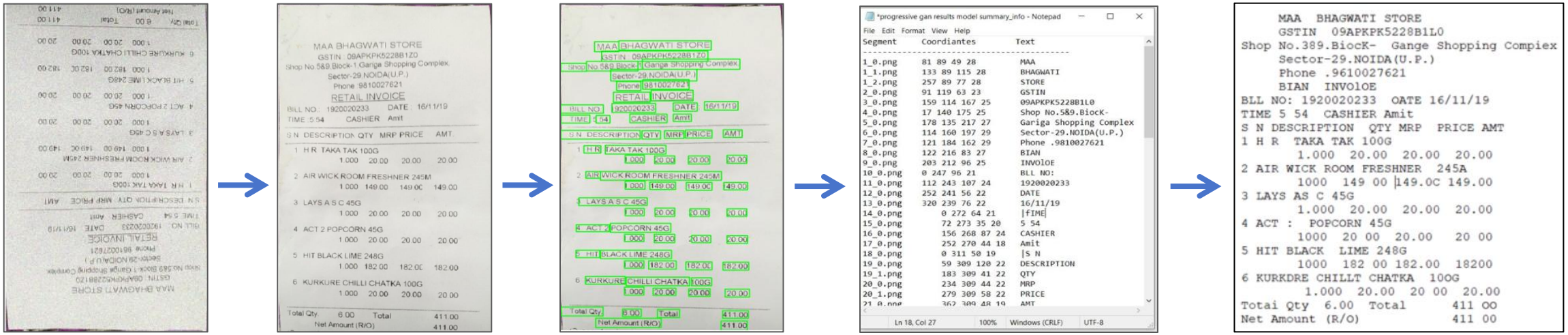
Example I: Exploratory Data Analysis



Where is the data stored? Which parts are calculated on the server?
How to render the scatter plot?

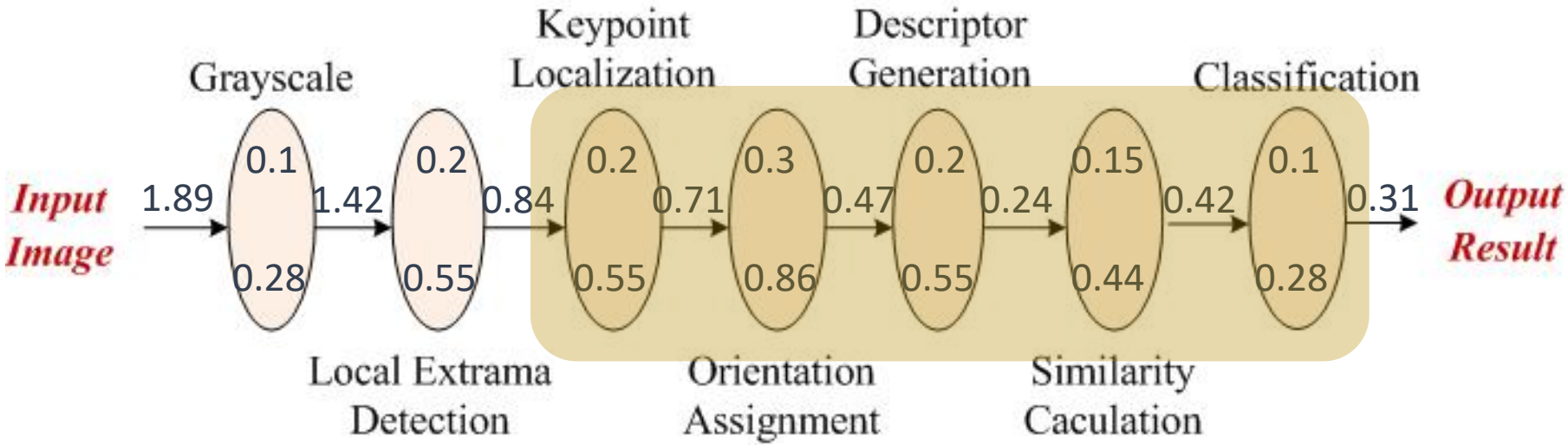
Example II: OCR



Pre-processing Text Detection Text Recognition Image Reconstruction

Which parts are placed on the server for calculation? Is there any difference between the server in the LAN and the server in the external network? Will it be faster to use parallel computing?

Computation Partitioning
a simple example



Optimal Partitioning 0.28 + 0.55 + 0.84 + 0.2 + 0.3 + 0.2 + 0.15 + 0.1 + 0.31 = 2.93

Local Execution: 0.28 + 0.55 + 0.55 + 0.86 + 0.55 + 0.44 + 0.28 = 3.51

Remote Execution: 1.89 + 0.1 + 0.2 + 0.2 + 0.3 + 0.2 + 0.15 + 0.1 + 0.31 = 3.45

Project Assignment

- **Part A** Select one web/mobile application to implement and test its performance on the browser/mobile device. The selected application should be compute-intensive and latency sensitive. Examples include but are not limited to:
  - exploratory data analysis,
  - hand gesture recognition,
  - face recognition,
  - image based object recognition,
  - augmented reality,
  - OCR and etc.

Project Assignment

- **Part B** Please analyze the module structure of the application, and try to partition the modules between the browser/mobile device and a remote server (or cloud). Test the performance of the application under various conditions/settings, and show via experiments what are the factors and how do they impact the performance of application.

Score Criterias

- Part A: 50 points; Part B: 50 points.
- Final deliverables for scoring
  - Final Report (60%)
  - Demonstration (40%)

Final Report

- 除了封面外，要求使用latex（cn.overleaf.com）,见Q群

1 引言

1.1 背景

(300 字-600 字)

1.2 应用介绍

(1000 字至 2000 字，此外应有配图)

2 实验设置

(1000 字-2000 字，此外应有配图或表)

3 实验结果

(1000 字-2000 字，此外图表应丰富，图文并茂)

4 讨论及结论

(1000 字以内)

5 其余章节、子章节有需要请自行添加

Final Report

- ***The module structure*** of the application should be included in your report
- ***Measure the application performance*** under as many settings as possible, e.g., different computations partitioning, input data, network connections (WiFi or 4/5G), bandwidth, or mobile devices/browsers.
- Beyond the experiment results, ***what are the insights*** you want to provide

Demonstrations

- Each group has ***6 minutes*** to demonstrate the system and results
- Design the demonstration procedures, and make sure it ***proceeds smoothly and logically***
  - A checklist indicating what you will demonstrate is required
- Debugging the demonstrations at least ***10 times*** in advance, and make sure ***no failures occur***

Time Schedule

- Send group information to jxliumk@163.com on **9/Oct/2025（仅限当天）**
  - **组长发送：所有成员(限制5-7人)姓名和学号，附上组长的Email和手机**
- Each group submits a *confirmation report to the* email jxliumk@163.com on **19/Oct/2025**. The report shows what application you select to implement, and the module structure of the application source codes. （无模板格式）
- *Demonstration* is arranged on **30/Nov/2025**
- Each group submits the *Final report* and *source code* via emails to jxliumk@163.com by **30/Nov/2025**. (不接受晚交的作业)（有模板格式要求）
- 以上日期均为当天23:59分