Analysis of the relationship between condominium poem and land features

Tohoku University Team A

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Background

Examinee

Let's reserve the hotel in Sendai
because I will take an entrance exam of Tohoku University.

Which one is affordable...?
Oh, the one in Kokubun-Cho is very cheap!
I will reserve this one.

The day before
the examination

The hotel is close to the entertainment district.
It's too noisy and I can't sleep...

Cause of this problem: We don't know the atmosphere of the area
for a city we visit for the first time.

We want to know an atmosphere of an area
in a clear and simple way.

Background

- **The way to represent an atmosphere of an area**

Richness of Nature	★★
Traffic Convenience	★★★
Public Safety	★

- Type 1 Residential District
- Commercial District
- Industrial District, etc...

Methods	Rating value	Area of usage	Expression in text
Comprehensibility	△	△	◎

- **What is a text showing an atmosphere of an area?**

Condominium poem

- Condominium poem is a catch copy in a condominium advertisement.[*1]

- These contents tend to be included in the poem.[*2]
  - Highly branded place names.
  - The quality of the living environment.
  - The advantages of location.
  - The closeness to the station.

The atmosphere of an area

- ref   *1: https://bunshun.jp/articles/-/10004 (文春オンライン, 2018/12/18)
               *2: https://1manken.hatenablog.com/entry/mansion-poems-tokyo-2019 (不動産ブログ「マンション・チラシの定点観測」, 2019/1/24)

Fulfilling the ideals of adults, enriched living in the heart of the city.

This area must be...
- calm atmosphere
- the center of town

Goal

We will generate condominium poems corresponding to addresses.

affect   express

| The location of the land e.g. price of land and traffic convenience | → | Atmosphere of the area | ← | Condominium poems |

example

| Kamisugi in Sendai | | calm atmosphere, the center of Sendai | | Fulfilling the ideals of adults, enriched living in the heart of the city. |
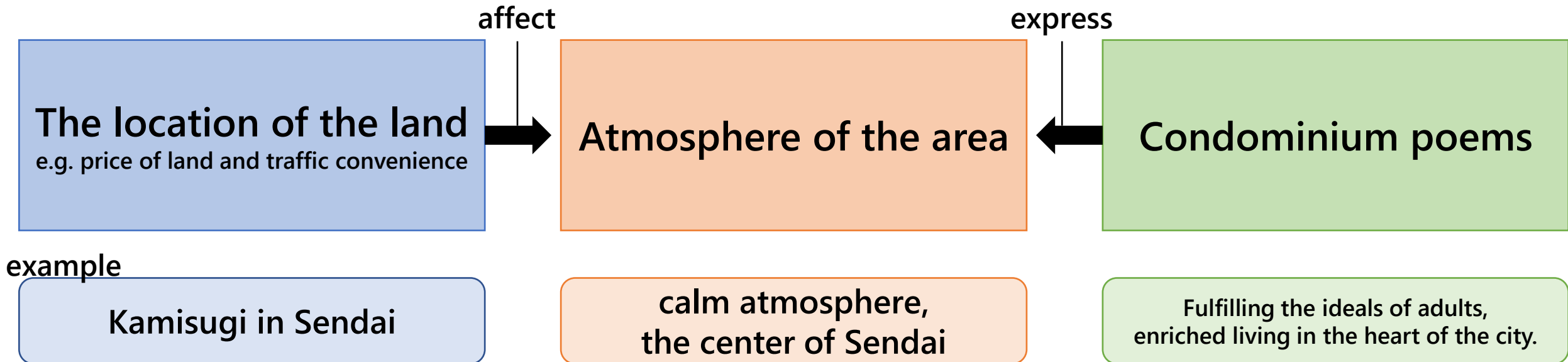
- We can know an atmosphere of an area indirectly from the condominium poems.

Dataset

- Training data   … Actual condominium poems in 23 districts in Tokyo
                        Number of Advertisement = 159
                        (Collected from real estate advertisement)

- Input data   … Location conditions

Data	Source
Land Price	令和５年地価公示価格（東京都分）, 東京都財務局, https://www.zaimu.metro.tokyo.lg.jp/kijunchi/R5kouji/index.html
Altitude	サーバサイドで経緯度から標高を求めるプログラム, 国土地理院, https://maps.gsi.go.jp/development/elevation_s.html
Distance to the nearest station	駅データ.jp, https://ekidata.jp/doc/station_g.php
Number of train lines	
Number of nearby stations	

List of words

- **Using MeCab to tokenize poems into morphemes**

```
日本の中枢、東京の中心に住まう。

['日本', 'の', '中枢', '、', '東京', 'の', '中心', 'に', '住まう', '。']
```

- **We created a list of words used in the poem**

都心	水	暮らし	華やぎ	未来	駅
The center of city	Water	Life	Gorgeous	Future	Station

Models

東京都新宿区〇〇△△ → **Enter address**

36.xxxx, 140.xxxx → **Convert to latitude/longitude**

- 100,000 yen/m^2
- 10 minutes to A station, ... → **Extract location conditions**

Deep Learning

Classification labeled neural networks

List of words that can be selected

Riverside, Beautiful, Hill, ...

Riverside	50 %
Beautiful	30 %
Hill	2 %

Probability of occurrence of words describing the location

Future Work

Language model

ChatGPT

Output condominium poems
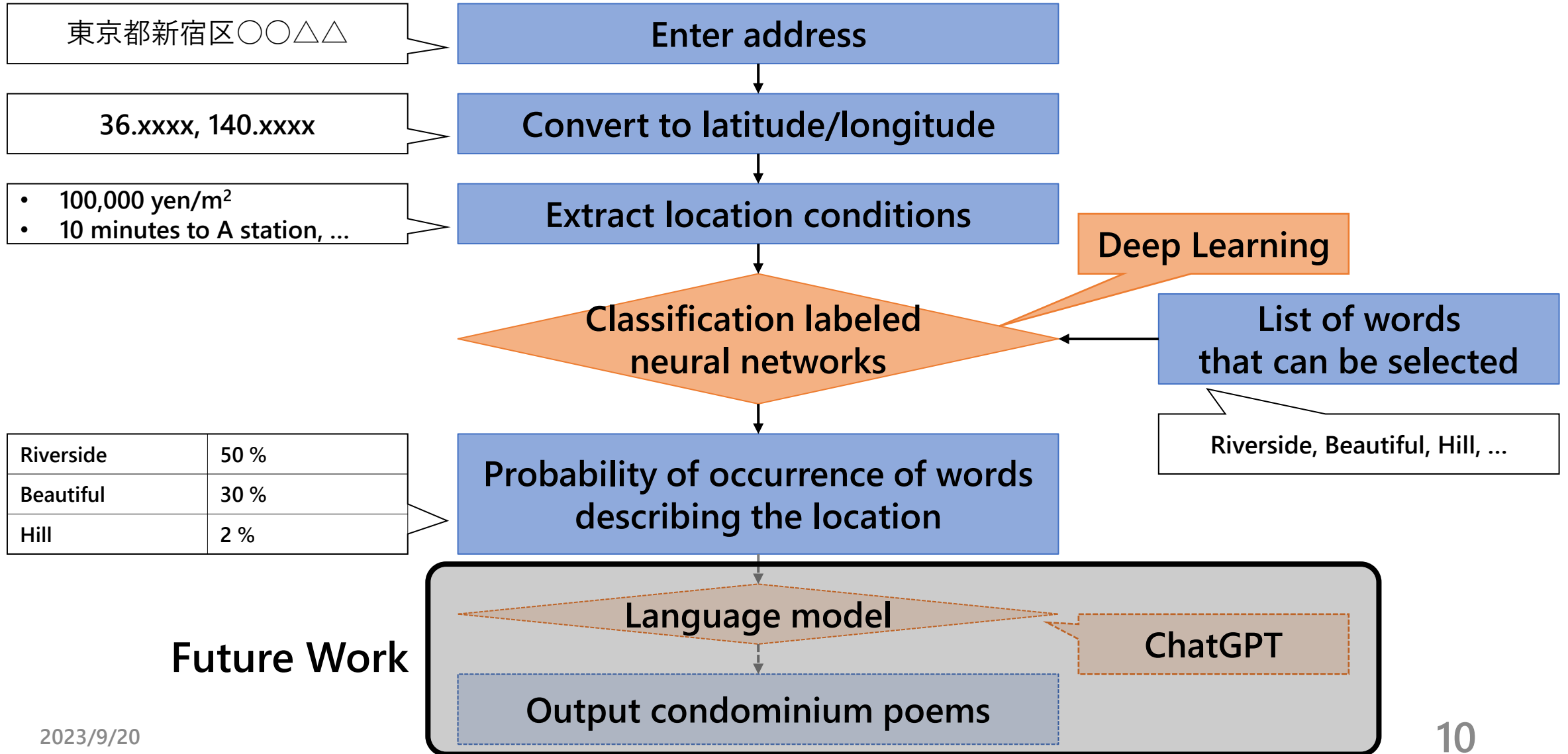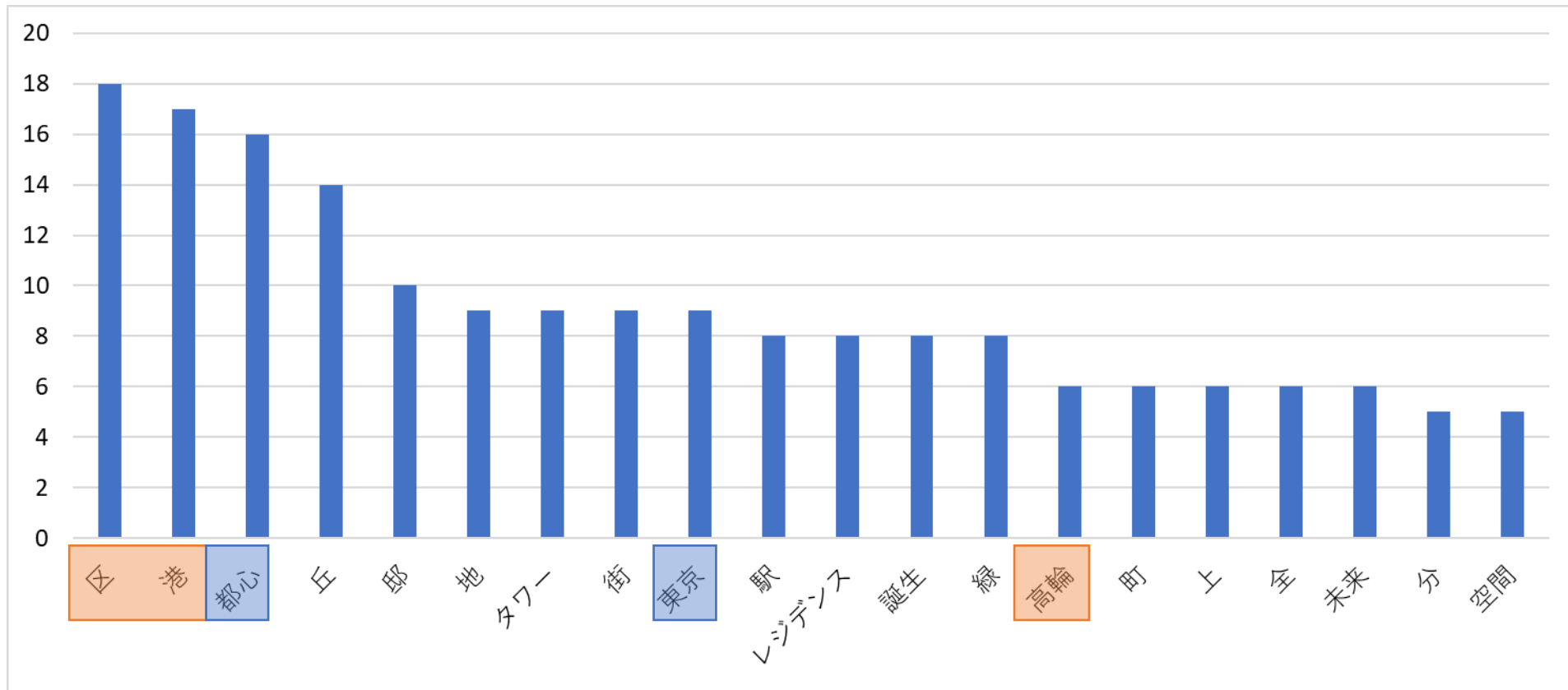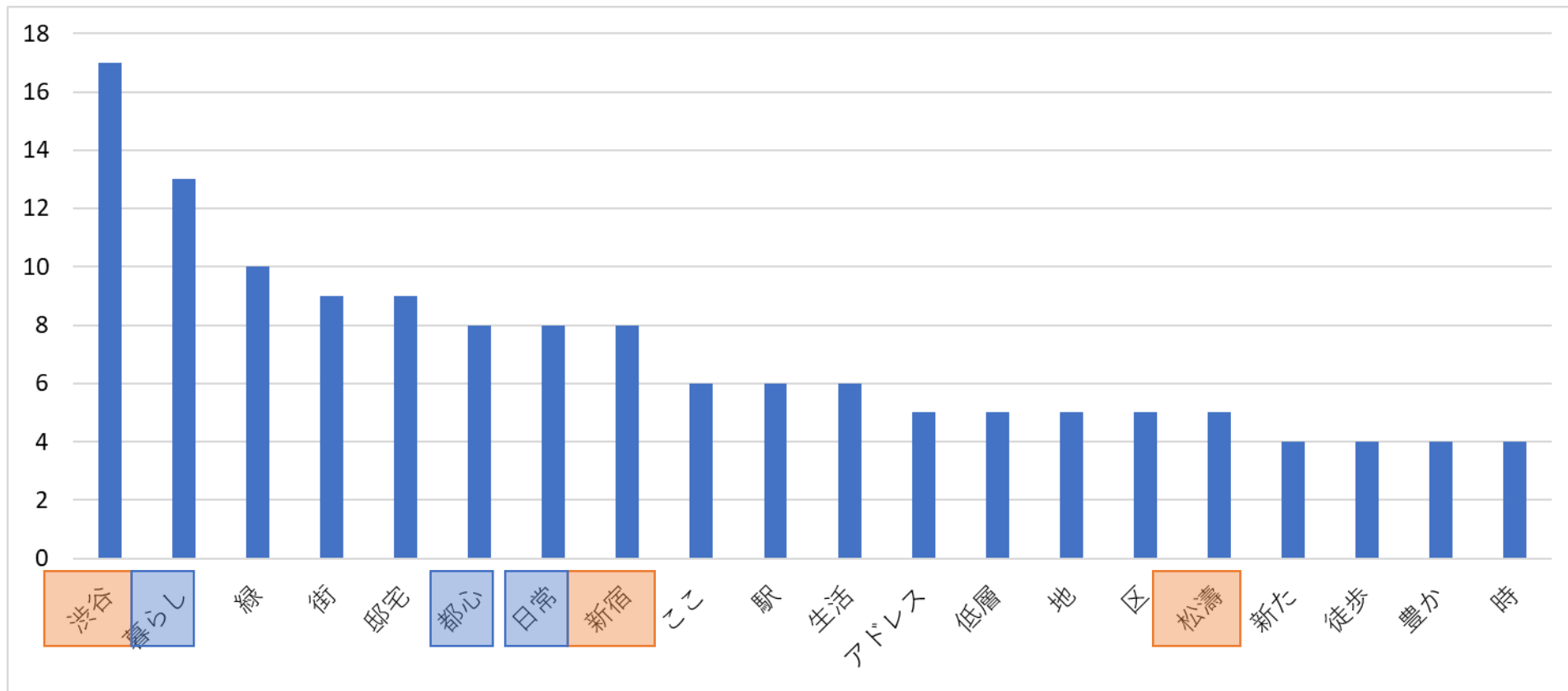
Data Analysis

- Words that appear frequently in condominium poem.
- **Minato-ku** (Number of Advertisement = 18)　* We excluded particles and punctuation.

Data Analysis

- Words that appear frequently in condominium poem.
- <u>Shibuya-ku</u> (Number of Advertisement = 13) * We excluded particles and punctuation.
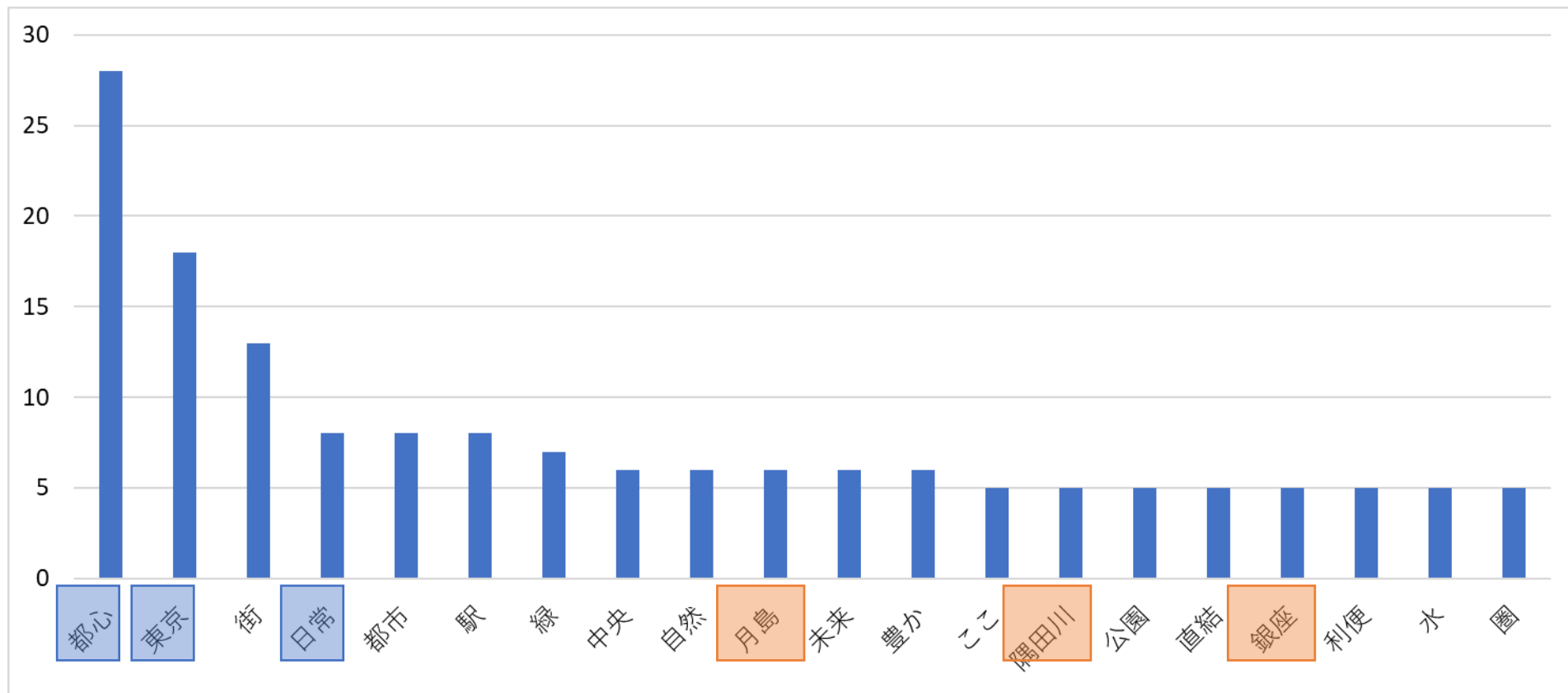
Data Analysis

- Words that appear frequently in condominium poem.
- <u>Chuo-ku</u> (Number of Advertisement = 13)   * We excluded particles and punctuation.

Data Analysis

- Words that appear frequently in condominium poem.
- <u>Nerima-ku</u> (Number of Advertisement = 14) * We excluded particles and punctuation.

Data Analysis

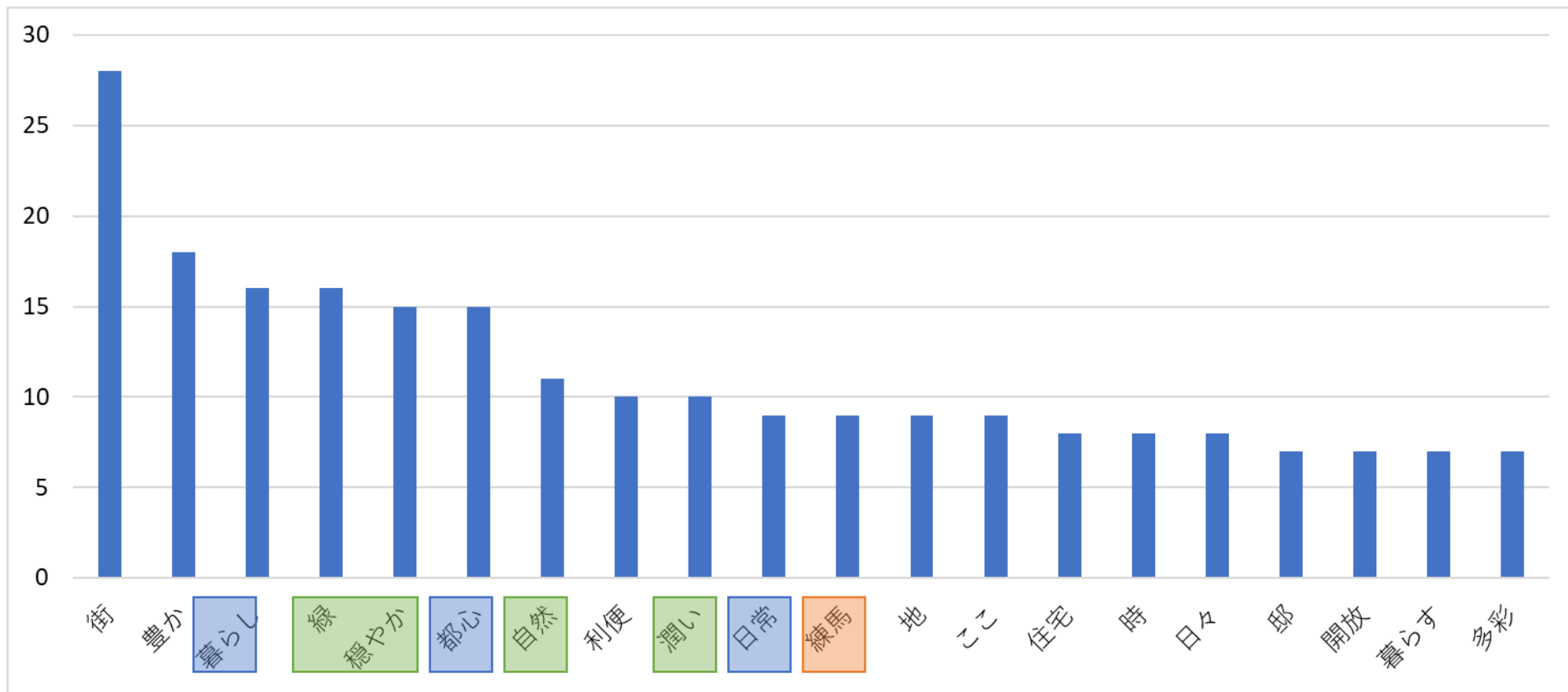- Words that appear frequently in condominium poem.
- <u>Adachi-ku</u> (Number of Advertisement = 14)　　* We excluded particles and punctuation.
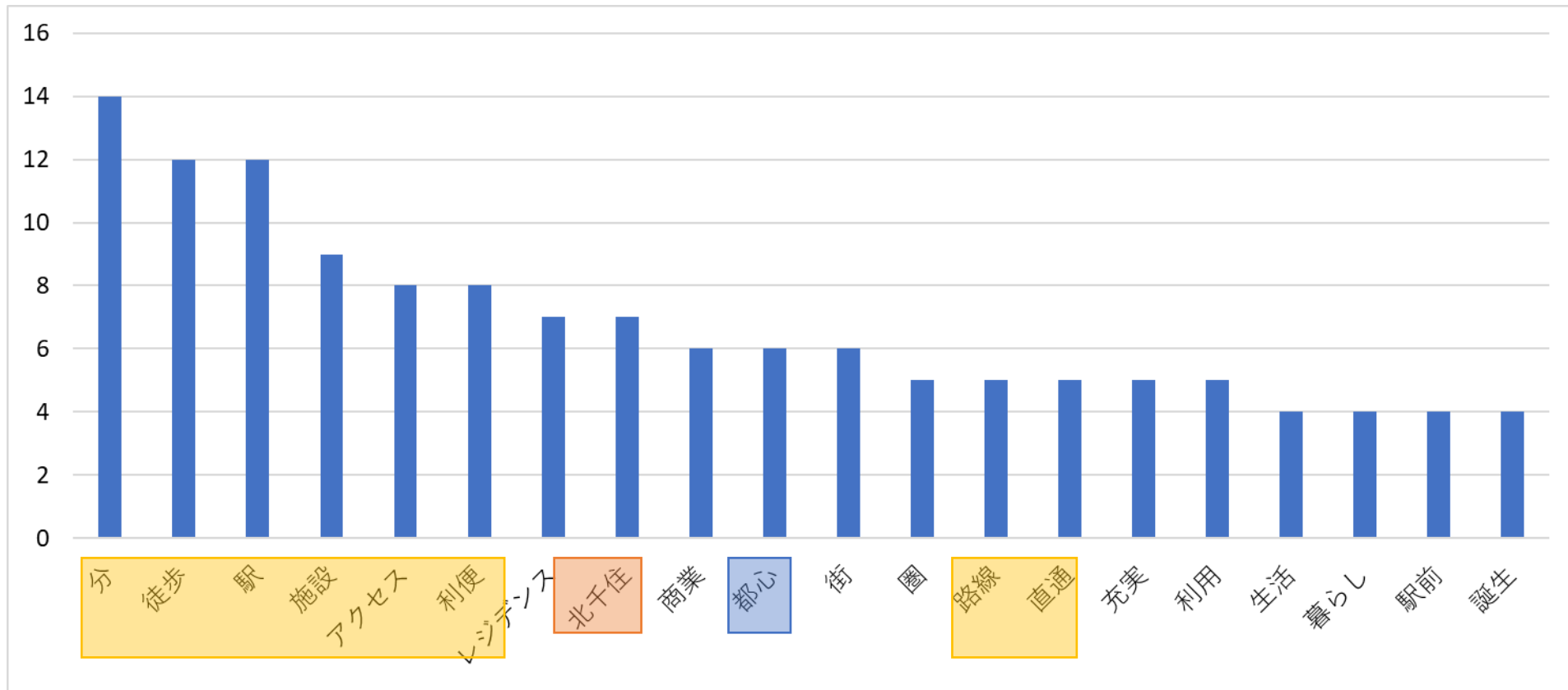
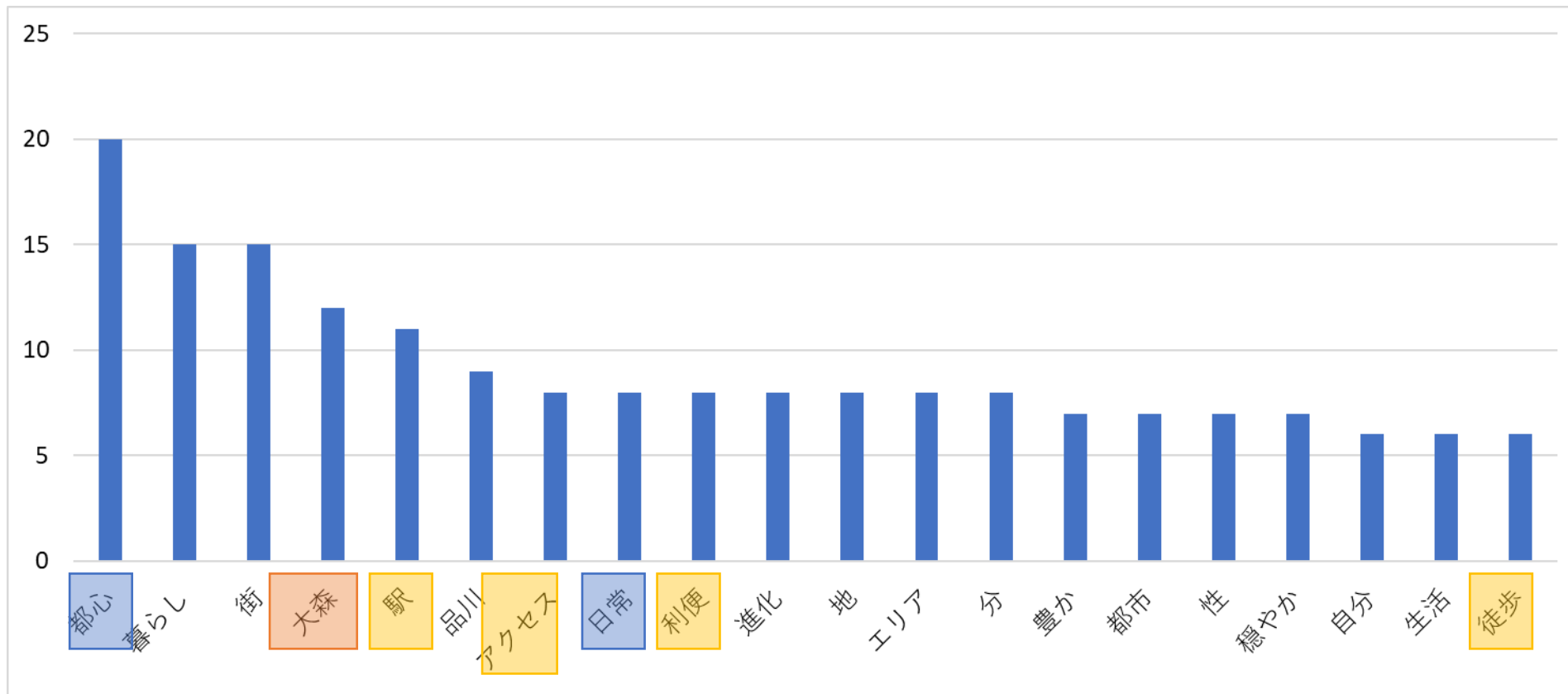# Data Analysis

- Words that appear frequently in condominium poem.
- <u>Oota-ku</u> (Number of Advertisement = 13)   * We excluded particles and punctuation.

Consideration

From words that appear frequently in condominium poem, we can say

- **Irrespective of the area, these words tends to be used**
  - 都心，東京，日常，暮らし

- **Luxury Condominium (e.g., in Minato-ku, Shibuya-ku) tends to use**
  - Name of the place where it is located

- **Condominium in residential areas tends to use**
  - Words that describe nature and greenery (e.g., 緑，穏やか，自然)

- **Condominium in areas away from the center of Tokyo (e.g., Adachi-ku, Oota-ku) tends to use**
  - Words that emphasize transportation convenience (e.g., 駅，徒歩，分）

Data Analysis

- **Number of trips by purpose**   *NOT used in this analysis*
- **From distributed data "豊洲2021"**

by origin					

O	通勤・通学	業務	帰宅	買物	食事	散策
港区	4%	17%	36%	10%	10%	3%
渋谷区	8%	11%	30%	20%	9%	9%
中央区	10%	5%	37%	20%	6%	3%
練馬区	9%	25%	21%	18%	3%	2%
足立区	3%	20%	50%	13%	10%	3%
大田区	11%	8%	40%	29%	2%	4%

by destination					

D	通勤・通学	業務	帰宅	買物	食事	散策
港区	26%	20%	9%	10%	11%	3%
渋谷区	17%	16%	13%	16%	11%	5%
中央区	16%	7%	28%	20%	6%	3%
練馬区	7%	26%	28%	15%	2%	2%
足立区	0%	18%	21%	26%	18%	3%
大田区	10%	10%	36%	29%	2%	4%

These data should represent the characteristics of each ward.

Results

- **20 words most likely to appear**
  。 / を / に / の / 、 / と / **都心** / **東京** / が / た / する / **街** / へ /
  「 / 」 / , / な / **TOKYO** / **未来**

- **Generate Condominium Poem by using ChatGPT**

'。','を','に','の','、','と','都心','東京','が','た','する','街','へ','」','「','. ',',','　','な','TOKYO','未来'

以上の''で囲んだ20個の単語を用いて，マンションの広告ポエム"1文で"作成してください

東京の都心に、未来を感じるマンションが、
街に誇るTOKYOの宝。

Future Tasks

- By including semantic connections between words, we will group words together by similarity rather than by individual words.
  - Example 1: 緑，水，川辺 -> words for nature
  - Example 2: 駅，利便性，アクセス -> words for transportation convenience

- We will analyze the role of a word from the words before and after it.
  - Example 1: Condominium in the city center
  - Example 2: Condominium away from the hustle and bustle of the city center
  - At present, both are counted as "city center"

- We will prepare an appropriate dataset to represent the characteristics of the land at the finer units than the ward level.