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Profile Matching in Python to Identify Tourist Destinations for The Development of National Tourism

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***Abstract*—Tourism has emerged as a key contributor to state revenue and has played a crucial role in national economic recovery following the Covid-19 pandemic, establishing itself as a new engine for the country's economic growth. In response to this, the government—through the Ministry of Tourism and Creative Economy—is actively promoting development in the tourism sector to enhance numerous tourist attractions in Indonesia, which are renowned for their beauty and recognized globally. However, the Ministry faces several challenges, including the need for technological advancements and the expansion of infrastructure. Addressing these needs will require substantial financial investment to optimize all tourism sites. This study aims to identify 22 tourist attractions across Indonesia using the Profile Matching method in Python programming, based on seven established criteria. The uniqueness about this study is that this research implemented a simple Python script and the tourist attractions are spread across all regions of Indonesia. The results of the study highlight three tourist destinations that warrant government attention for optimization: Lake Maninjau, Rantepao, and Seminyak. To facilitate improvement, several areas require focus, including upgrading access roads, enhancing basic facilities, fostering community participation, developing human resources, and leveraging technology. The analysis using Python demonstrates that the software performs efficiently, processing 22 data points with seven criteria in a mere 0.06 seconds.**

***Index Terms*—Tourism, tourist destinations, profile matching, python.**

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I. Introduction

According to the Central Bureau of Statistics (BPS), Indonesia's state revenue from 2022 to 2024 has reached Rp 8,076 trillion [1]. Non-tax state revenue serves as one of the sources of funding used by the government to support various development initiatives outside the tax sector, and it is a key component of the State Budget (APBN). Non-Tax State Revenue (PNBP) also plays a role in supporting national financing, covering sectors such as infrastructure, education, and health care [2]. The PNBP refers to levies payable by individuals or entities in exchange for directly or indirectly receiving benefits from services or the utilization of resources and rights provided by the state. There are several types of PNBP, namely PNBP from natural resources; other PNBP; income from separated state assets; and revenue from public service agencies [3], [4].

Tourism is one of the sectors that makes a significant contribution to PNBP in Indonesia. The revenue generated from this sector comes from hotel taxes, restaurant taxes, entrance fees to tourist attractions, and spending by international tourists in various economic sectors. The Indonesian government focuses on developing the tourism industry as a major contributor to Gross Domestic Product (GDP) and as a way to promote local economic growth, especially in less developed areas [5]. This shows that tourism has positively contributed to the country's economy, as explained by [6], that tourism has become a crucial foundation for the recovery of the national economy after the COVID-19 pandemic. Positive indications began to appear in 2023, with the number of international tourist arrivals reaching 11.68 million. This figure exceeded previous expectations, which ranged from 6 million to 8.5 million. Although the number is still not up to the level of visits before the COVID-19 pandemic in 2019, the contribution of international tourists has boosted tourism sector revenue to more than USD 14 billion, or approximately Rp 218 trillion. Previously, the Ministry of Tourism and Creative Economy (Kemenparekraf) had set a target for foreign exchange earnings ranging from USD 7.08 billion to USD 9.99 billion for last year. Minister of Tourism

and Creative Economy, Sandiaga Uno, revealed that the tourism and creative economy sector contributed 3.9 percent to the Gross Domestic Product (GDP) last year, while the added value from the creative economy reached Rp 1,414.77 trillion.

There are research findings that support the article mentioned above, such as the study by Hasibuan et al. [7] which shows that in 2018, the tourism sector contributed 5.2% to Gross Domestic Product (GDP). In 2019, this contribution fell to 4.7%, and in 2020, it dropped significantly to 4.0%. In 2021, it saw a slight increase to 4.2%, while in 2022, it fell again to 3.6%. Tourism's foreign exchange earnings in 2018 reached US$16.43 billion. This number increased to US$16.91 billion in 2019 but fell sharply to only US$3.31 billion in 2020. Foreign exchange earnings remained very low in 2021, at just US$0.54 billion, before starting to recover to $4.26 billion in 2022. The number of workers in this sector was 19.46 million in 2018. This number grew to 20.76 million in 2019 but fell slightly to 20.43 million in 2020. In 2021, employment in the sector rebounded to 21.26 million, and by 2022, it further rose to 22.89 million.

The research by [8] showed the impact of the tourism sector on economic growth in Indonesia using time-series data from 1975 to 2017. The method used in this study involves a simultaneous equation model estimated using Two-Stage Least Squares. The findings show that the tourism sector positively impacts economic growth, while economic growth, in turn, also positively affects tourism. Additionally, other factors influencing tourism demand in Indonesia include the exchange rate and inflation rate.

Looking at the fact that tourism significantly impacts the country's economy, it cannot be denied that tourism has become a new engine of economic growth for the nation [9]. Therefore, the Kemenparekraf strives to promote the development of tourism and the creative economy by conducting expert surveys involving 84 experts and leaders from academia, government, and industry in the preparation of the "Tourism and Creative Economy Review 2023/2024" [10]. The survey results show that approximately 76.19% of experts believe the tourism sector in Indonesia is currently experiencing a recovery. Looking at tourism trends in 2022, 35.71% of the experts are confident that tourism will return to its pre-pandemic condition by 2024. Furthermore, it is projected that there will be 7–9 million international tourist arrivals in 2023. The majority of experts (46.15% of the total) believe that developing high-caliber and innovative tourist destinations plays a significant role in the future growth of the tourism sector. Meanwhile, there are various other factors affecting its development, including the contribution of technology in enhancing the tourism experience (43.59%), the increase in income among local tourists (38.46%), and the expansion of infrastructure and international flight routes (35.90%).

The need for infrastructure expansion is one of the main issues hindering the development of tourism in Indonesia, as inadequate tourism infrastructure in several areas limits access and facilities for tourists [11]. Additionally, the insufficient contribution of technology, which results in less-than-optimal communication and publication, prevents information about tourist destinations from effectively reaching potential tourists, while the poor quality of human resources (HR) contributes to low competency and professionalism within the tourism industry [12]. Indonesia offers a wide range of attractive tourist destinations that even become international tourist attractions. The country's natural charms draw tourists from abroad to explore even its remote areas from beautiful beaches and stunning national parks to traditional villages each offering its own unique experience for visitors. Currently, Indonesia already boasts beautiful tourist spots that are recognized around the world [13]. It cannot be denied that not all tourist attractions can receive government attention due to limited funding for their management. Therefore, the aim of this study is to help the government determine which tourist attractions should receive greater and more optimal attention in order to make them more attractive to both international and domestic tourists, based on the input criteria that will be used in the evaluation.

II. Related Work

Some studies related to the selection of tourist attractions or sites have used Multi Criteria Decision Making (MCDM) techniques. In a study by Hanggowibo et al., the Weighted Product (WP) method was used to develop a Decision Support System (DSS) for choosing tourist attractions in the Province of Yogyakarta. The criteria used in selecting these attractions include cost, distance, and estimated number of tourists, with the alternatives being the Indonesian Batik Museum, Maritime Museum, Vredeburg Fortress Museum, Puro Pakualam Museum, and Sandi Museum. The results show that the Maritime Museum stands out as the most popular tourist attraction in Yogyakarta when compared to the other museums [14].

Researchers Maria et al. used the Analytical Hierarchy Process (AHP) as the MCDM technique to develop a Decision Support System (DSS) for selecting tourist attraction locations in Yogyakarta, such as Prambanan Temple, Parangtritis Beach, Kaliurang, Malioboro, and Taman Pintar. The criteria used for the selection included distance, cost, facilities, safety, transportation, and the type of attraction. The results show that Prambanan Temple stands out as a noteworthy tourist destination [15].

Reference [16] used the simple additive weighting (SAW) method as the MCDM technique to develop a Decision Support System (DSS) for selecting tourist attractions in Aceh, with the alternatives being Baitturahman Grand Mosque, Lampuuk Beach, Sabang, Tsunami Museum, and Kuta Malaka Waterfall. The criteria used to aid tourists in making decisions in this study include distance, cost, facilities, time, and age. The results show that Baitturahman Grand Mosque was the best tourist attraction in Aceh at the time of the study [16]. In addition to previous study, [17] also used SAW to design a DSS for selecting tourist attractions in Purworejo. The criteria used in her study include cost, distance, age, facilities, and time. The alternative tourist attractions considered were Seplawan Cave, Geger Menjangan Peak, Silangit Waterfall, Ketawang Beach, and Jatimalang Beach. The study's results show that Ketawang Beach is the best-recommended tourist destination [17].

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Studies by [18] and [19] used the profile matching method, a MCDM technique, to develop DSS for selecting tourist attractions in Lombok and Kalimantan, respectively. Muhaimin used criteria such as cost, facilities, attraction type, and distance, while Fauzan used criteria including comfort, facilities, beauty, distance, and cost. All the literature previously described shows various MCDM techniques used by researchers to select tourist attractions from a range of alternatives. The main objective is to facilitate data processing through a system designed and implemented by the researchers. The criteria used in related literature show similarities, such as cost, distance, and facilities.

The difference between related literature and this study is that the researcher utilizes the Python tool by developing a script to carry out the Profile Matching process. Furthermore, although there are similarities in the MCDM method used in this study and in Muhaimin and Fauzan's, this study does not design or build a decision support system. Instead, by employing Python, the processing time is expected to be faster than developing a full system. There are also differences in criteria, as the criteria in this study are an enhancement of the tourism issues previously raised by [12], [11], and also, in accordance with the opinions of experts from the survey conducted by the Kemenparekraf [10]. Additionally, in related literature, the selection of tourist attractions used as samples for data processing in DSS typically focuses on a single region and involves about 3–5 tourist attractions. In contrast, this study utilizes more than 5 tourist attractions spread across Indonesia, and these were further developed based on [13].

III. Research Method

This research method consists of several phases of the study. There are a number of phases carried out, as shown in Fig. 1.

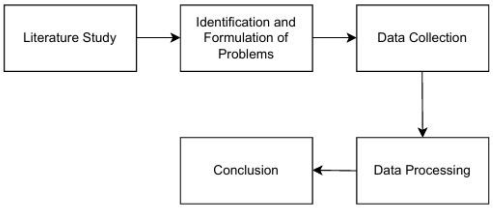

Fig. 1. Research stages.

A. Literature Study

Researchers conducted a literature study related to the fact that tourism is becoming a new driver of the country's economic growth, especially after demonstrating its significant influence on the national economy following the COVID-19 pandemic. However, there are still several obstacles to developing national tourism, as shown by the survey results from the Ministry of Tourism and Creative Economy. Therefore, the researchers performed a literature study to identify the factors affecting the development of national tourism. In addition, the researchers also searched for methods or techniques for selecting tourist attractions or locations that can be used to give some recommendations to the government for optimization, considering limited funding for developing tourism.

To gather all this information, the researcher collected data from various sources, such as online articles and scientific journals. The search for information from these sources revealed several factors that can influence the selection of tourist attractions. Furthermore, the researcher found various MCDM techniques for choosing recommended tourist attractions based on previously defined criteria. The literature study also shows a key difference between this study and previous ones, which is that this research did not create a complete system but instead implemented a simple script in Python, which is expected to be more efficient than developing a full application. The criteria used in this study are more diverse than those used by previous studies, and the tourist attractions are not limited to a single region but are spread across all of Indonesia.

B. Identification and Formulation of Problems

After conducting the literature study, the researcher carried out problem identification and formulation. The problem is identified that there are still many obstacles in developing national tourism, even though tourism has become a new engine for the country's economic growth. Therefore, it is necessary to determine the criteria that are likely to influence the selection of tourist attractions.

The problem formulation in this study is to determine which tourist attractions should be prioritized for development, given the limitations of available funding, using the MCDM Profile Matching method implemented through Python programming based on predefined criteria.

C. Data Collection

The data collected here consists of two types, criteria and tourist attractions. For the criteria, the researcher drew upon factors that hinder the growth of national tourism, as explained by Mardiyantoro et al. and Fitriyani et al., and in accordance with the results of a survey by the Kemenparekraf. For the tourist attractions, the researcher refers to the official website of the related minister and data on beautiful and world-renowned tourist attractions as presented by [13]. The criteria that have been successfully developed include accessibility, accommodations, employment absorption for the local community, information availability, community involvement, technology and innovation, and human resource development.

The location of tourist attractions was those that spread across Java, Sumatra, Sulawesi, Bali, Lombok, NTT, and Irian Jaya. However, not all tourist attractions are used; instead, those currently capturing tourists' interest for a visit were selected, including Ancol, Bromo, Borobudur, Danau Toba, Danau Maninjau, Mentawai, Belitung, Pulau Komodo, Toraja,

Wakatobi, Bunaken, Rantepao, Nusa Dua, Ubud, Canggu, Uluwatu, Seminyak, Mandalika, Gili Trawangan, Labuan Bajo, Kelimutu, and Raja Ampat.

D. Data Processing

For this stage, there will be two processes: the profile matching step and the coding process using Python.

1) Profile matching stage

Profile Matching is an analytical method used to evaluate the conformity between the desirable criteria profile (ideal profile) and the criteria profile possessed by the object of study (actual profile). This method is effective in identifying gaps between the actual and ideal conditions, as well as in determining the strategic steps needed to achieve those ideal conditions [20]. There are several steps used in this process. The first step involves determining the criteria and their weights. At this stage, relevant criteria for tourism development are identified based on literature and data from the Kemenparekraf. These criteria include regulations and policies, human resource quality, communication and publication, and tourism infrastructure. Each criterion is assigned a weight based on its level of importance in tourism development. This weight determination is made based on core factor and secondary factor aspects.

The second step involves determining the ideal profile and the actual profile. The ideal profile refers to the desirable condition for each criterion. This profile is determined based on standards or targets for tourism development. The actual profile, meanwhile, reflects the current condition for each criterion, based on the data that has been collected. The third step involves calculating the gap or discrepancy. The gap is measured by the difference between the ideal profile and the actual profile. This gap shows how far the current condition deviates from the ideal condition. The fourth step involves calculating the total score. This is done by multiplying each gap by its respective criterion weight to produce a gap weight. The total score for each object of study (such as a tourist destination) is then calculated by adding up the gap weights for all criteria.

2) Python stage

This study measures the program execution time used to calculate the gap values and weighted gap values based on the ideal profile for various tourist locations. The measurement is conducted on a standard office computer specification, namely a latest-generation Intel Core i5 processor or equivalent (quad-core); 8 GB DDR4 RAM; 256 GB SSD storage; Windows 10 operating system; and Python version 3.8. The programming is carried out according to several stages of Profile Matching, starting with reading the actual profile data previously collected in Excel format. This section imports the pandas and time modules and defines the path to the Excel file containing the actual profile data of the tourist locations.

Next, the ideal profile values and criterion weights are defined. This part sets the ideal profile values and weights for each criterion used in the calculation. Then, programming to measure execution time and read sample data is done. The code measures the start time of execution and reads data from the Excel file using pandas for the sample data used. Subsequently, programming is done to calculate the weighted gap values. This part calculates the gap between the actual and ideal profiles for each criterion and multiplies the gap values by their respective weights to obtain the weighted gap values.

The next programming stage calculates the total weighted gap values and arranges the ranking. This section sums the weighted gap values for each tourist location and ranks them based on the total score. The final programming step measures the end time of execution and displays the results. The code measures the end time and prints the total time required to run the program.

E. Conclusion

After processing the data, the researcher will draw conclusions and provide recommendations based on the analysis results. The conclusions are made in accordance with the problem formulation that was established.

IV. RESULT

In accordance with the data processing that uses two methods, in this section the researcher will divide the discussion and results into two detailed parts based on the methods used, namely Profile Matching and Python.

A. Profile Matching

This discussion will cover the two completion stages of Profile Matching, while the next two stages will use programming with the help of Python.

1) Criteria and Weighting

This percentage distribution uses a scale of 1 to 10 that reflects the established priorities and provides clear guidance in performance evaluation and strategic decision-making. With the weights assigned to each criterion, the assessment results highlight areas that require more attention and provide a strong foundation for more effective planning and decision-making. This percentage distribution can be seen in Table 1.

Table 1.
Criteria and Weighting

Criteria	Indicator	Weighting (%)
Accessibility		20
	Availability of Adequate Public Transportation	10
	Ease of Access by Private Transportation Distance > 10 KM	7
	Ease of Access by Private Transportation Distance > 20 KM	3
	Ease of Access by Private Transportation Distance > 30 KM	1
Accomodation		15
	Availability of Non-Star Hotels or Lodgings	10
	Availability of Rental Rooms or Budget Hotels	5.5
	Public Facilities (toilets, parking areas, etc.)	1
Absorption capacity of local workforce		15

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	Very High Absorption Capacity > 70%	10
	High Absorption Capacity > 50%	7
	Moderate Absorption Capacity > 30%	5
	Low Absorption Capacity > 10%	3
	Very Low Absorption Capacity < 10%	1
Availability of information		10
	Integrated Digital Information	10
	Presence of Information Centers	5.5
	Availability of Maps and Tourist Guides	1
Community Involvement		15
	Very Good Involvement	10
	Good Involvement	8
	Moderate Involvement	6
	Slight Involvement	4
	Poor Involvement	2
	No Community Involvement	0
Inovation and Technology		15
	High and Good Use of Technology and Innovation	10
	High Use of Technology and Innovation	8
	Moderate Use of Technology and Innovation	6
	Low Use of Technology and Innovation	4
	Very Low Use of Technology and Innovation	2
	No Use of Technology and Innovation	0
Human Resource Development		10
	Very good	10
	Good	8
	Adequate	6
	Little	4
	Poor	2
	None	0

2) Ideal profile

In this study, the researcher establishes ideal values for each criterion in Indonesia's tourism sector using a scale of 10. These ideal values are based on optimal conditions desired to maximize efficiency, attractiveness, and visitor satisfaction. The designation of core factors and secondary factors is also applied.

- *Core factor*

For this factor, it consists of:

(a) Accessibility

The ideal value of 9–10 reflects a tourism location that is very easily accessible with good road infrastructure, adequate public transportation, and ease of reaching the destination from the city center or major airports. High accessibility is very important to increase the number of tourist visits.

(b) Accommodation facilities

The ideal value of 8–10 indicates that accommodation facilities must be very adequate and of high quality. Tourist destinations must provide a variety of clean, comfortable, and safe accommodation options, as well as additional facilities such as restaurants, swimming pools, and room service. Good accommodation facilities have a major impact on the tourist experience.

(c) Availability of Information.

The ideal value of 9–10 reflects the importance of highly accessible information, available in multiple languages, and complete and accurate information about attractions, activities, travel routes, and emergency services. Good information helps tourists plan and enjoy their trips.

(d) Local labor absorption

The ideal value of 7–9 indicates that a high level of local labor in the tourism sector provides direct economic benefits to the local community and creates sustainable employment opportunities. This also supports the sustainability of the local economy.

- *Secondary Factor*

For secondary factors, it consists of:

(a) Community Involvement.

The ideal value of 7–9 indicates the importance of community involvement in the management and promotion of tourism destinations, including participation in cultural and environmental preservation. Community involvement is important to maintain cultural and environmental sustainability and increase social acceptance.

(b) Human Resource Development.

The ideal value of 8–10 is given to indicate that excellent human resource development programs are essential. Including ongoing training to improve the skills and professionalism of workers in the tourism sector. Skilled human resources improve the quality of service and competitiveness of destinations.

(c) Technology and Innovation.

The ideal value of 8–10 indicates the very high importance of the use of technology and innovation. This includes the adoption of digital technology for marketing, online reservation systems, mobile applications for tourists, and innovative solutions to improve the visitor experience. The use of technology and innovation improves the efficiency and quality of the tourist experience.

B. Python

The creation of program code to measure the execution time of the program used to calculate the gap value and the weighted gap value based on the ideal profile for various tourist locations. The program code created in this study is explained as follows:

1) *Reading actual profile from Excel file*
This section imports the pandas and time modules, and defines the path to the Excel file containing the actual profile data of the tourist locations.

```
import pandas as pd
import time
file_path_samples = "Data Sample.xlsx"
```

2) *Determination of ideal profile value and criteria weight*
This section defines the ideal profile values and weights for each criterion used in the calculation.

```
profil_ideal = {
    "Profil Aktual Aksesibilitas": 10,
    "Profil Aktual Akomodasi": 9,
    "Daya Serap Tenaga Lokal": 8,
    "Ketersediaan Informasi": 10,
    "Keterlibatan Komunitas": 9,
    "Teknologi dan Inovasi": 9,
    "Pengembangan SDM": 8
}
bobot_kriteria = {
    "Profil Aktual Aksesibilitas": 0.20,
    "Profil Aktual Akomodasi": 0.15,
    "Daya Serap Tenaga Lokal": 0.15,
    "Ketersediaan Informasi": 0.10,
    "Keterlibatan Komunitas": 0.15,
    "Teknologi dan Inovasi": 0.15,
    "Pengembangan SDM": 0.10
}
```

3) *Measuring execution time and reading sample data*
This code measures the start time of execution and reading data from an Excel file using pandas, for the sample data used as in Table 2.

```
start_time = time.time()
df_samples = pd.read_excel(file_path_samples
```

4) *Calculating the Weighted Gap Value*
This section calculates the gap value between the actual profile and the ideal profile for each criterion, and multiplies the gap value by the appropriate weight to obtain the weighted gap value. The formulas are shown as the following [18]:

$$\text{GAP} = \text{Actual Profile} - \frac{\text{Target}}{\text{Ideal Profile}} \quad (1)$$

$$\text{Weighted GAP value} = \text{GAP} \times \text{Weight criteria} \quad (2)$$

```
for column in profil_ideal.keys():
df_samples[f'Gap {column}'] =
profil_ideal[column] - df_samples[column]
df_samples[f'Gap Terbobot {column}'] =
df_samples[f'Gap {column}'] *
bobot_kriteria[column]
```

5) *Calculating weighted gap values and ranking*
This section adds up the weighted gap values for each tourist location and ranks them based on the total value which shown in the following formulas [18]:

$$\text{Total weighted value} = \Sigma(\text{weighted GAP value}) \quad (3)$$

```
df_samples['Total Nilai'] = df_samples[[f'Gap
Terbobot {col}' for col in
profil_ideal.keys()]].sum(axis=1)
df_result = df_samples[['Lokasi Wisata', 'Total
Nilai']]
df_result_sorted =
df_result.sort_values(by='Total Nilai')
```

6) *Measuring end time of execution and displaying results*
This code measures the end time of execution and prints the total time required to run the program. In addition to measuring the execution time, this program is also used to

Table 2.
Data Sample

Destination	Current Accessibility Profile	Current Accommodation Profile	Local Energy Absorption Capacity	Availability of Information	Community Engagement	Technology and Innovation	Human Resources Development
Ancol	5	9	7	9	9	8	5
Bromo	5	4	5	4	4	8	7
Borobudur	8	2	7	10	8	1	4
Toba	3	6	7	7	8	1	4
Danau Maninjau	3	3	5	2	6	3	2
Mentawai	7	8	6	7	1	2	7
Belitung	6	8	10	2	7	9	10
Komodo	3	3	6	1	7	6	8
Toraja	7	1	2	8	2	8	4
Wakatobi	9	5	10	10	7	3	1
Bunaken	1	8	5	7	5	2	1
Rantepao	4	3	1	8	3	10	1
Nusa Dua	7	8	8	8	3	1	4
Ubud	6	7	4	10	7	8	8
Canggu	1	3	3	7	4	5	8
Uluwatu	10	7	1	9	5	1	7
Seminyak	4	3	5	1	2	1	7
Mandalika	10	5	3	1	5	2	10
Gili Trawangan	6	3	9	8	10	8	5
Labuan Bajo	5	10	4	1	3	4	8
Kelimutu	3	10	1	3	2	5	3
Raja Ampat	4	1	10	3	9	2	6

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process the actual profile data of various tourist locations and calculate the total weighted gap value. The following is a ranking of tourist locations based on the total weighted gap value, arranged from the most appropriate to the least appropriate ideal profile as shown in Table 3.

```
end_time = time.time()
execution_time = end_time - start_time
print(f"Waktu eksekusi: {execution_time} detik")
```

Table 3.
Total Weighted Value

Destination	Total Value
Nusa Dua	1.40
Mentawai	1.45
Ancol	1.70
Gili Trawangan	2.05
Belitung	2.20
Wakatobi	2.85
Uluwatu	2.95
Ubud	3.05
Borobudur	3.35
Mandalika	3.70
Bromo	3.80
Labuan Bajo	4.00
Raja Ampat	4.05
Bunaken	4.15
Toba	4.25
Toraja	4.80
Komodo	5.10
Kelimutu	5.15
Canggu	5.65
Seminyak	5.80
Rantepao	5.85
Danau Maninjau	5.90

V. CONCLUSION

After data processing and data analysis, it can be concluded that the Profile Matching method used in this study shows that the greater the total final value obtained, the more tourist attractions that should receive attention from the government to be optimized. The results of data processing show 3 tourist attractions that need attention from the government, namely Lake Maninjau, Rantepao and Seminyak. For this reason, recommendations that can be given for further improvement are improving road access, basic facilities, community involvement, human resource development, and the use of technology. Hopefully, with these findings, the government can boost the improvement in these 3 tourist attractions. The use of Python shows that the execution time measurement shows that this program is efficient enough to run on a standard office computer, namely for 0.06 seconds to process 22 data equipped with 7 criteria. The execution time shows sufficient performance to support data processing on a small to medium scale without significant obstacles. The results of the ranking of tourist locations based on the weighted gap value provide useful guidance for further evaluation, assisting in decision making related to the development and management of tourist locations. For the future work, the criteria can be added to have more comprehensive matters, including cost and the attraction offers.

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