

CNC Part Cost Estimation and Supplier Matching

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Approach

We scraped supplier data from Indiamart using BeautifulSoup and requests, then organized it into a Pandas DataFrame. The `estimate_cnc_part_cost_range` function calculates CNC manufacturing costs based on material, usage, size, and complexity. The `match_suppliers` function finds suppliers matching these specs and costs, calculating distances and compiling results. Challenges included finding suitable sites and accurate formulas, addressed through research. Future improvements include using Geopy and Google API for precise distance calculations and better web scraping for optimized supplier matching.



Project vision and mission

01.

Data Collection via Web Scraping.
Gather real-world data on CNC
manufacturing suppliers

02.

Cost Estimation Algorithm
Create a function that estimates the
cost of a CNC part based on its
characteristics.

03.

Supplier Matching Algorithm
Develop a system to match a given
part specification with suitable
suppliers.

Key Findings

- Effective Data Collection
- Cost Estimation Accuracy
- Supplier Matching Efficiency
- Challenges in Data Access
- Potential for Improvement





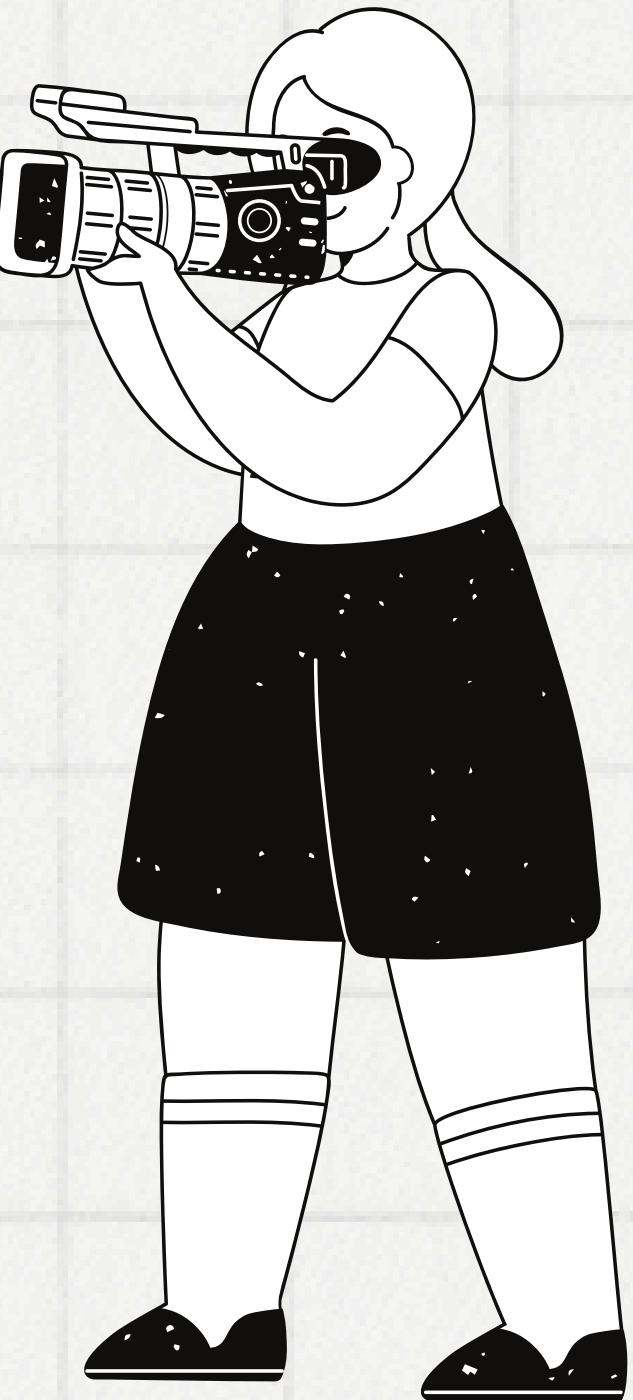
Demonstration

Webscraper

- Runing the web scrapper file: python WebScraper.py
- This file doesn't take any inputs and gives the output CSV file which contains the suppliers information
- Tool used for web scraping: BeautifulSoup
- Website used for webscrapping : <https://dir.indiamart.com/>

Output

	Supplier_Name	Location	Materials	price
0	Shusa Mechatronics	Changodar, Ahmedabad, Gujarat	MS/SS	320
2	Valk Engimach Private Limited	LAMDAPURA, Vadodara, Gujarat	Aluminium	3000
4	Metloy Blast Tech	Kathwada, Ahmedabad, Gujarat	Stainless Steel	50
6	Shubh Castings	Goregaon, Mumbai, Maharashtra	Aluminium	225
8	Keytex Machines	Sachin, Surat, Gujarat	Stainless Steel	850
10	Accurate Industries	Amraiwadi, Ahmedabad, Gujarat	Carbon Steel	150
16	Prezmech The Machine Shop	Gole Market, New Delhi	Stainless Steel	340
18	Reneet Technology	Virar East, Vasai Virar, Thane, Maharashtra	Stainless Steel	15
20	ARC Enterprise	Kothariya, Rajkot, Gujarat		100
22	Sahaj Technofinish	Kotada Sangani, Rajkot, Gujarat	Carbon Steel	500
24	Mars CNC Components	Lower Parel, Mumbai, Maharashtra		39900
26	Audhe Industries	Sidco Industrial Estate, Coimbatore, Tamil Nadu	Stainless Steel Grades	250
28	Shanthi Engineering Works	Karapakkam, Chennai, Tamil Nadu	Stainless Steel	850
30	R Mansukhlal & Co.	Nagdevi, Mumbai, Maharashtra	MS	980



Cost Estimation Algorithm

- This algorithm meticulously considers several key factors, including the material cost per unit, machine time, tool costs, and total usage, to calculate a precise estimated cost range for CNC parts.
- Leveraging the provided data, it offers informed suggestions based on parameters such as material type and cost range, thereby aiding in more effective decision-making.

Sample Inputs:

Enter the Material: Aluminum

Unit Of material: 30

Size of the part: Large

Complexity : Complex

Output:

Estimated total cost range: \$489.50 – \$874.50

Matching suppliers:

Supplier: Keytex Machines, Location: Sachin, Surat, Gujarat, Material: Stainless Steel, Distance: 90 km

Supplier: Shanthi Engineering Works, Location: Karapakkam, Chennai, Tamil Nadu, Material: Stainless Steel, Distance: 119 km

Cost Estimation Algorithm output

```
Materials:  
'Aluminum',  
'Steel',  
'Plastic',  
'MS/SS',  
'Stainless Steel',  
'Carbon Steel',  
'Mild Steel',  
'MS',  
'Cast Iron',  
'Alloy Steel',  
'En - 36'
```

```
-----  
size:  
'Small, Medium, Large'
```

```
-----  
complexity:  
'Simple'  
'Moderate'  
'Complex'
```

Enter the Material: Aluminum

Unit Of material: 30

Size of the part: Large

Complexity : Complex

Estimated total cost range: \$489.50 - \$874.50

Matching suppliers:

Supplier: Keytex Machines, Location: Sachin, Surat, Gujarat, Material: Stainless Steel, Distance: 90 km

Supplier: Shanthi Engineering Works, Location: Karapakkam, Chennai, Tamil Nadu, Material: Stainless Steel, Distance: 119 km

**Thank you
very much!**