HUMAN RESOURCE ANALYSIS USING PYTHON

by

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ABSTRACT

- The field of human resources analysis, which can be understood as an approach to human recourses management focused on data and analytical thinking.
- Human resources analysis an optimal use of human resources to ensure that the human resources of an organization remain an asset and not a liability.
- The project analyzes the data of the employees working in the organization.

LITERATURE REVIEW

1 . **Human Resource Analysis with Python (**AMAN KHARWAL**):**

Abstract-The field of human resources analysis, which can be understood as an approach to human resources management focused on data and analytical thinking, is quickly becoming an indispensable part of organizational configurations.

2. Social Network Analysis in Human Resource Development: A New Methodology (JOHN-PAUL HATALA, Louisiana State University**):**

Abstract-Through an exhaustive review of the literature, this article looks at the applicability of social network analysis (SNA) in the field of human resource development

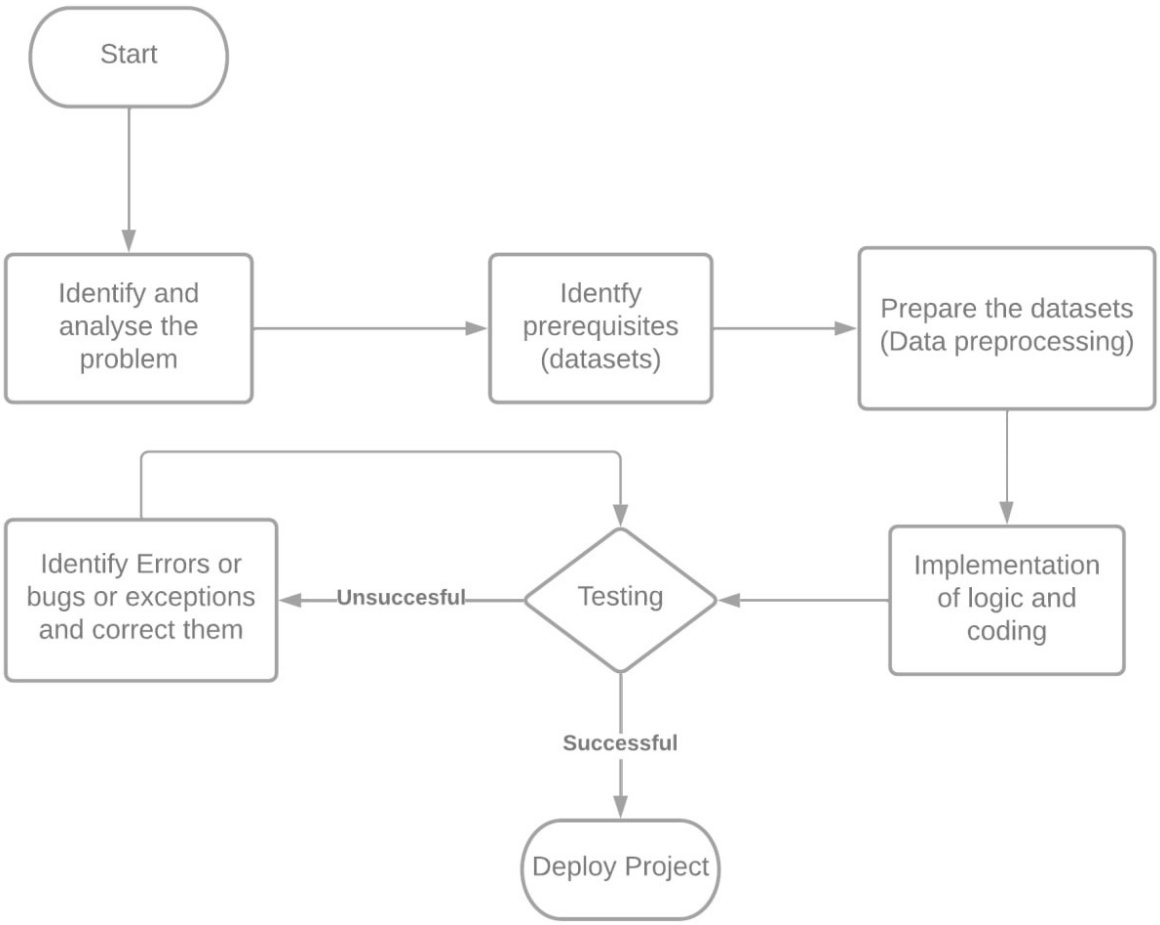
3. Utility Analysis for Decisions in Human Resource Management (John W. Boudreau Cornell University**):**

Abstract-This chapter will discuss utility analysis (VA), which attempts to answer such questions by focusing on decisions about human resources. Utility analysis refers to the process that describes, predicts and/or explains what determines the usefulness or desirability of decision options, and examines how that information affects decisions

METHODS

- The project is coded in python
- The dependencies that are used are
    - Numpy – mathematical functions
    - Pandas – data analysis and manipulation
    - Matplotlib – plotting library
    - Seaborn – visualization library based on matplotlib
    - Ploty – plot 2d data and color scaling functionality

IMPLEMENTATION FLOWCHART



FUNCTIONING OF THE CODE

Libraries:

```
from flask import Flask, render_template

from flask_assets import Bundle, Environment
import pandas as pd
import json
import plotly
import plotly.express as px
import csv
```

Flask initialization

```
app = Flask(__name__)
assets = Environment(app)
if __name__ == "__main__":
    app.run(debug=True)
```

Generating new column from the data using conditions

```
def train_data():
    df = pd.read_csv("aug_train.csv")
    with open('aug_train.csv',newline='') as file:
        data = csv.DictReader(file)
        count = 0
        for row in data:
            if row['education_level'] == 'Graduate' or row['education_level'] ==
'Phd':
                if int(row['training_hours']) >= 10:
                    df.loc[count, 'hit_counter'] = 'hit'
            else:
                df.loc[count, 'hit_counter'] = 'not_hit'
            print(count)
            count+=1
        df.to_csv("aug_train.csv", index=True)
```

flask links and chart plotting

```

@app.route('/')
def index():
    return render_template('index.html')

@app.route('/about')
```

```
def about():
    return render_template('about.html')


@app.route('/tra1n')
def tra1n():
    train_data()
    return render_template('tra1n.html',description="Data is trained")

@app.route('/chart1')
def chart1():

    fig = px.imshow(train.isnull().T)
    fig.update_layout(title='Missing values in data set')
    #fig.show()

    graphJSON = json.dumps(fig, cls=plotly.utils.PlotlyJSONEncoder)
    header="chart1"
    description = "temp1"
    return render_template('notdash2.html', graphJSON=graphJSON,
header=header,description=description)

@app.route('/chart2')
def chart2():
    plot_city = train['city'].value_counts()[0:50].reset_index()
    plot_city.columns = ['City','Count']
    px.bar(plot_city,x='City',y='Count',title='City',color='Count')
    fig =
px.bar(plot_city,x='City',y='Count',template='gridon',title='City',color='Count')
    fig.update_layout(title_text='plot_city',title_y=0.5)

    graphJSON = json.dumps(fig, cls=plotly.utils.PlotlyJSONEncoder)
    header="chart2"
    description = "temp2"
    return render_template('notdash2.html', graphJSON=graphJSON,
header=header,description=description)


@app.route('/chart3')
def chart3():
    plot_cdi =train['city_development_index'].value_counts().reset_index()[0:50]
    plot_cdi.columns = ['cdi','Count']
    plot_cdi['cdi'] = plot_cdi['cdi'].astype('str')
    fig = px.bar(plot_cdi,y="Count", x="cdi",color='Count',title='City
development index')
```

```
    graphJSON = json.dumps(fig, cls=plotly.utils.PlotlyJSONEncoder)
    header="chart3"
    description = "temp3"
    return render_template('notdash2.html', graphJSON=graphJSON,
header=header,description=description)


@app.route('/chart4')
def chart4():
    plot_gender = train['enrolled_university'].value_counts().reset_index()
    plot_gender.columns = ['enrolled_university','count']
    fig =
px.pie(plot_gender,values='count',names='enrolled_university',title='enrolled_uni
versity')

    graphJSON = json.dumps(fig, cls=plotly.utils.PlotlyJSONEncoder)
    header="chart4"
    description = "temp4"
    return render_template('notdash2.html', graphJSON=graphJSON,
header=header,description=description)

@app.route('/chart5')
def chart5():
    plot_gender = train['education_level'].value_counts().reset_index()
    plot_gender.columns = ['education_level','count']
    fig =
px.pie(plot_gender,values='count',names='education_level',title='education_level'
)

    graphJSON = json.dumps(fig, cls=plotly.utils.PlotlyJSONEncoder)
    header="chart5"
    description = "temp5"
    return render_template('notdash2.html', graphJSON=graphJSON,
header=header,description=description)


@app.route('/chart6')
def chart6():
    plot_gender = train['major_discipline'].value_counts().reset_index()
    plot_gender.columns = ['major_discipline','count']
    fig = px.pie(plot_gender,values='count',names='major_discipline',title='Major
discipline')
    fig.update_traces(textposition='inside', textinfo='percent+label')
    graphJSON = json.dumps(fig, cls=plotly.utils.PlotlyJSONEncoder)
```

```
    header="chart6"
    description = "temp6"
    return render_template('notdash2.html', graphJSON=graphJSON,
header=header,description=description)

@app.route('/chart7')
def chart7():
    plot_gender = train['company_size'].value_counts().reset_index()
    plot_gender.columns = ['company_size','count']
    fig =
px.pie(plot_gender,values='count',names='company_size',title='company_size is
determined by no. of people employees')

    graphJSON = json.dumps(fig, cls=plotly.utils.PlotlyJSONEncoder)
    header="chart7"
    description = "temp7"
    return render_template('notdash2.html', graphJSON=graphJSON,
header=header,description=description)

@app.route('/chart8')
def chart8():
    train = pd.read_csv('aug_train.csv')
    plot_gender = train['hit_counter'].value_counts().reset_index()
    plot_gender.columns = ['hit_counter','count']
    fig = px.pie(plot_gender,values='count',names='hit_counter',title='desired
employment graph')

    graphJSON = json.dumps(fig, cls=plotly.utils.PlotlyJSONEncoder)
    header="chart8"
    description = "temp8"
    return render_template('notdash2.html', graphJSON=graphJSON,
header=header,description=description)
```

HTML FILES

Index.html

```
  <!DOCTYPE html>
<html lang="en">

<head>
  <meta charset="utf-8">
  <meta content="width=device-width, initial-scale=1.0" name="viewport">
```

```
  <title>HOME</title>
  <meta content="" name="description">
  <meta content="" name="keywords">


  <!-- Google Fonts -->
  <link
href="https://fonts.googleapis.com/css?family=Open+Sans:300,300i,400,400i,600,600
i,700,700i|Roboto:300,300i,400,400i,500,500i,700,700i&display=swap"
rel="stylesheet">

  <!-- Vendor CSS Files -->
  <link href = "{{ url_for('static',filename='css/style.css')}}" rel =
"stylesheet">
  <link href = "{{
url_for('static',filename='vendor/animate.css/animate.min.css')}}" rel =
"stylesheet">
  <link href = "{{ url_for('static',filename='vendor/aos/aos.css')}}" rel =
"stylesheet">
  <link href = "{{
url_for('static',filename='/vendor/bootstrap/css/bootstrap.min.css')}}" rel =
"stylesheet">
  <link href = "{{ url_for('static',filename='vendor/bootstrap-icons/bootstrap-
icons.css')}}" rel = "stylesheet">
  <link href = "{{
url_for('static',filename='vendor/boxicons/css/boxicons.min.css')}}" rel =
"stylesheet">
  <link href = "{{
url_for('static',filename='vendor/glightbox/css/glightbox.min.css')}}" rel =
"stylesheet">
  <link href = "{{ url_for('static',filename='vendor/swiper/swiper-
bundle.min.css')}}" rel = "stylesheet">



  <!-- =======================================================
  * Template Name: Moderna - v4.8.0
  * Template URL: https://bootstrapmade.com/free-bootstrap-template-corporate-
moderna/
  * Author: BootstrapMade.com
  * License: https://bootstrapmade.com/license/
  ======================================================== -->
</head>

<body>
```

```
  <!-- ======= Header ======= -->
  <header id="header" class="fixed-top d-flex align-items-center header-
transparent">
    <div class="container d-flex justify-content-between align-items-center">

      <div class="logo">
        <h1 class="text-light"><a href="index.html"><span>HUMAN RESOURCE
MANAGEMENT</span></a></h1>
        <!-- Uncomment below if you prefer to use an image logo -->
        <!-- <a href="index.html"><img src="assets/img/logo.png" alt=""
class="img-fluid"></a>-->
      </div>

      <nav id="navbar" class="navbar">
        <ul>
          <li><a class="active " href="/">Home</a></li>
          <li><a href="about">About</a></li>
          <li><a href="tra1n">Train</a></li>
          <li class="dropdown"><a href="#"><span>Graphs</span> <i class="bi bi-
chevron-down"></i></a>
            <ul>
              <!--<li><a href="chart1">missing values</a></li>-->
              <li><a href="chart2">City Distribution</a></li>
              <li><a href="chart3">City Development Index</a></li>
              <li><a href="chart4">Enrolled Univertisty Index</a></li>
              <li><a href="chart5">Educational Level Index</a></li>
              <li><a href="chart6">Major Descipline</a></li>
              <li><a href="chart7">Company Size</a></li>
              <li><a href="chart8">Desired Employment Chart</a></li>
              </ul>
          </li>
        </ul>
        <i class="bi bi-list mobile-nav-toggle"></i>
      </nav><!-- .navbar -->

    </div>
  </header><!-- End Header -->

  <!-- ======= Hero Section ======= -->
  <section id="hero" class="d-flex justify-cntent-center align-items-center">
    <div id="heroCarousel" class="container carousel carousel-fade" data-bs-
ride="carousel" data-bs-interval="5000">

      <!-- Slide 1 -->
```

```
      <div class="carousel-item active">
        <div class="carousel-container">
          <h2 class="animate__animated animate__fadeInDown">WELCOME TO HUMAN-
RESOUCE MANAGEMENT</h2>
          <p class="animate__animated animate__fadeInUp">Use the drop down option
to browse through the graphs</p>
        </div>
      </div>
   </div>
  </body>
</html>
```

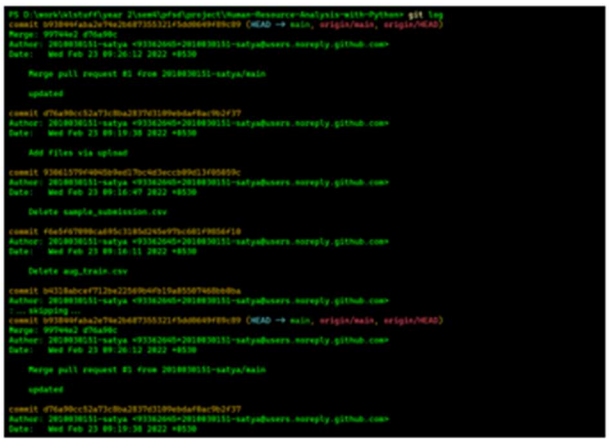
Plotty.html

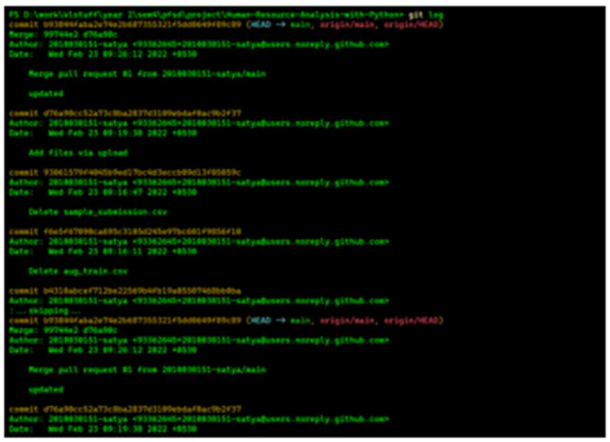
```
<!doctype html>
<html>
    <head>
        <meta charset="utf-8">
        <meta content="width=device-width, initial-scale=1.0" name="viewport">

        <title>chart</title>
        <meta content="" name="description">
        <meta content="" name="keywords">


        <!-- Google Fonts -->
        <link
href="https://fonts.googleapis.com/css?family=Open+Sans:300,300i,400,400i,600,600
i,700,700i|Roboto:300,300i,400,400i,500,500i,700,700i&display=swap"
rel="stylesheet">

        <!-- Vendor CSS Files -->
        <link href = "{{ url_for('static',filename='css/style.css')}}" rel =
"stylesheet">
        <link href = "{{
url_for('static',filename='vendor/animate.css/animate.min.css')}}" rel =
"stylesheet">
        <link href = "{{ url_for('static',filename='vendor/aos/aos.css')}}" rel =
"stylesheet">
        <link href = "{{
url_for('static',filename='/vendor/bootstrap/css/bootstrap.min.css')}}" rel =
"stylesheet">
        <link href = "{{ url_for('static',filename='vendor/bootstrap-
icons/bootstrap-icons.css')}}" rel = "stylesheet">
```

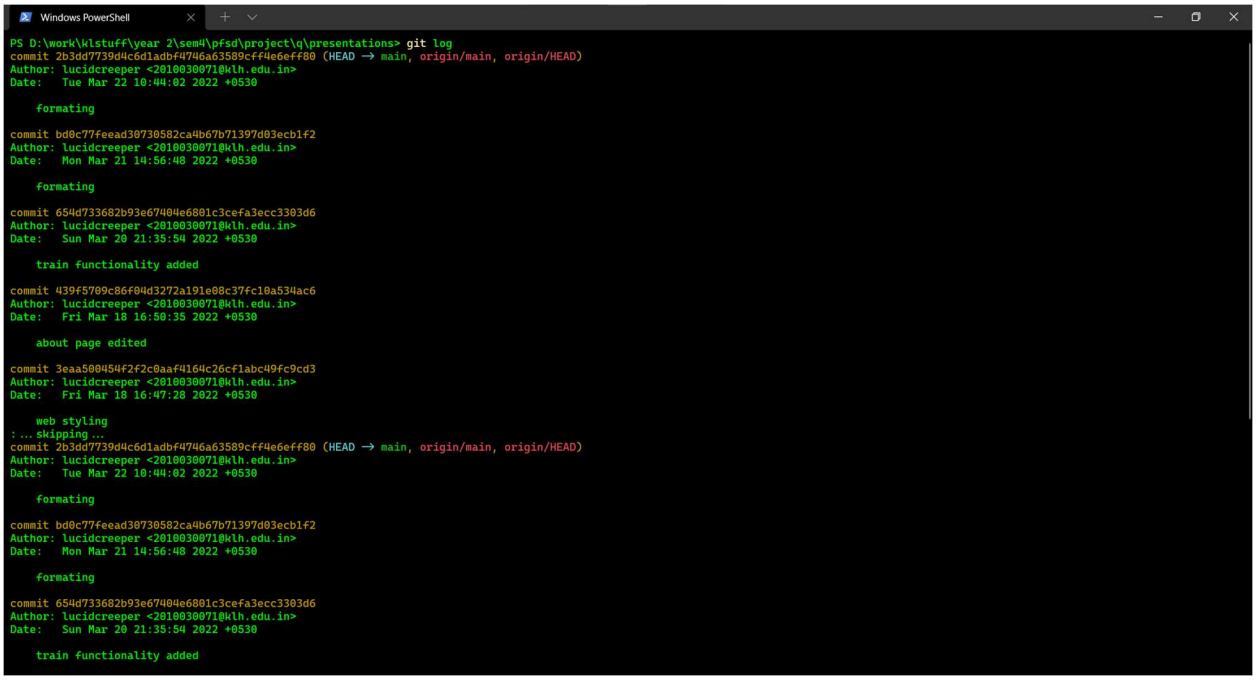
```
        <link href = "{{
url_for('static',filename='vendor/boxicons/css/boxicons.min.css')}}" rel =
"stylesheet">
        <link href = "{{
url_for('static',filename='vendor/glightbox/css/glightbox.min.css')}}" rel =
"stylesheet">
        <link href = "{{ url_for('static',filename='vendor/swiper/swiper-
bundle.min.css')}}" rel = "stylesheet">



        <!-- =======================================================
        * Template Name: Moderna - v4.8.0
        * Template URL: https://bootstrapmade.com/free-bootstrap-template-
corporate-moderna/
        * Author: BootstrapMade.com
        * License: https://bootstrapmade.com/license/
        ======================================================= -->
      </head>
      <header id="header" class="fixed-top  align-items-center header-opaque ">
        <div class="container d-flex justify-content-between align-items-center">

          <div class="logo">
            <h1 class="text-light"><a href="index.html"><span>HUMAN RESOURCE
MANAGEMENT</span></a></h1>

          </div>

          <nav id="navbar" class="navbar">
            <ul>
              <li><a class="active " href="/">Home</a></li>
              <li><a href="about">About</a></li>
              <li><a href="tra1n">Train</a></li>
              <li class="dropdown"><a href="#"><span>Graphs</span> <i class="bi
bi-chevron-down"></i></a>
                <ul>
                  <!--<li><a href="chart1">missing values</a></li>-->
                  <li><a href="chart2">City Distribution</a></li>
                  <li><a href="chart3">City Development Index</a></li>
                  <li><a href="chart4">Enrolled Univertisty Index</a></li>
                  <li><a href="chart5">Educational Level Index</a></li>
                  <li><a href="chart6">Major Descipline</a></li>
                  <li><a href="chart7">Company Size</a></li>
                  <li><a href="chart8">Desired Employment Chart</a></li>
                  </ul>
```

```
              </li>
            </ul>
            <i class="bi bi-list mobile-nav-toggle"></i>
          </nav><!-- .navbar -->

        </div>
      </header><!-- End Header -->


  <div id="chart" class="chart"></div>
</body>

<script id="graph" src="https://cdn.plot.ly/plotly-latest.min.js"></script>
<script id = "graph" type="text/javascript">
    var graphs = {{graphJSON | safe}};
    Plotly.plot('chart',graphs,{});
</script>

</html>
```

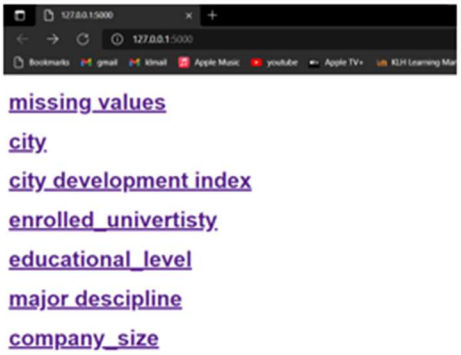
GITHUB COMMITS

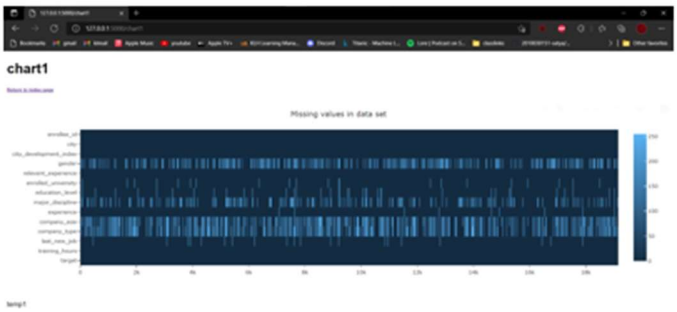




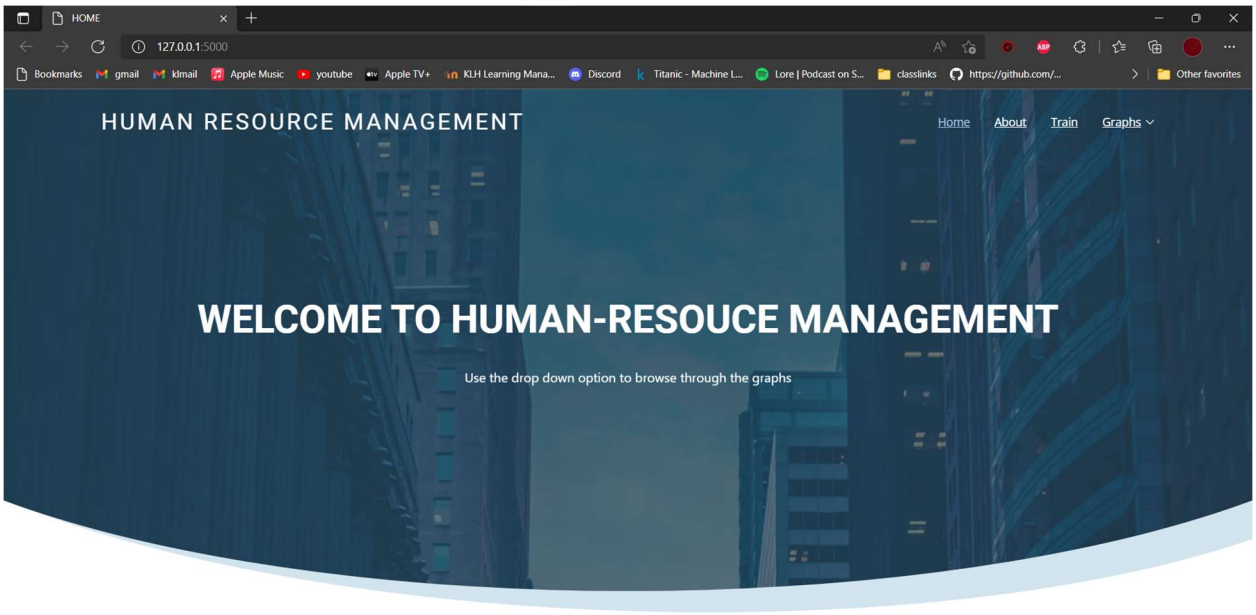


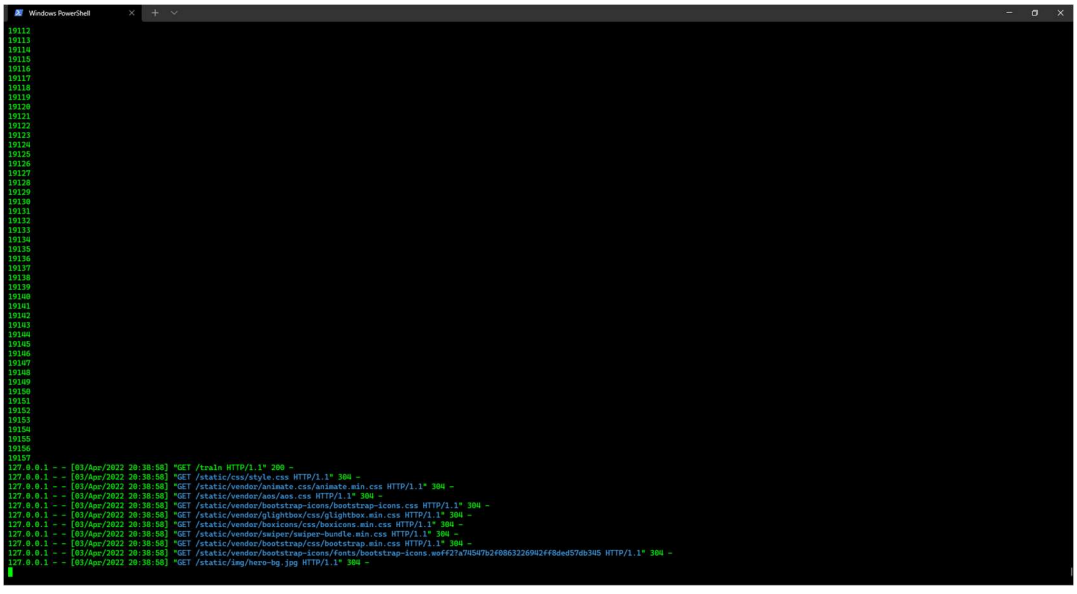
APLHA TESTING

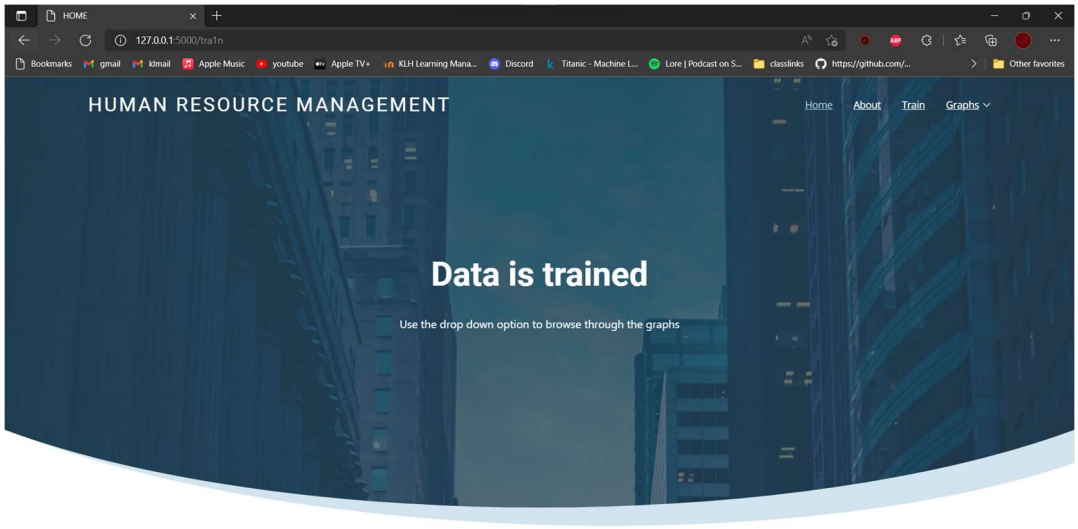




BETA TESTING






HOME
127.0.0.1:5000/tra1n
Bookmarks
gmail
klmail
Apple Music
youtube
Apple TV+
KLH Learning Mana...
Discord
Titanic - Machine L...
Lore | Podcast on S...
classlinks
https://github.com/...
Other favorites
HUMAN RESOURCE MANAGEMENT
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Data is trained
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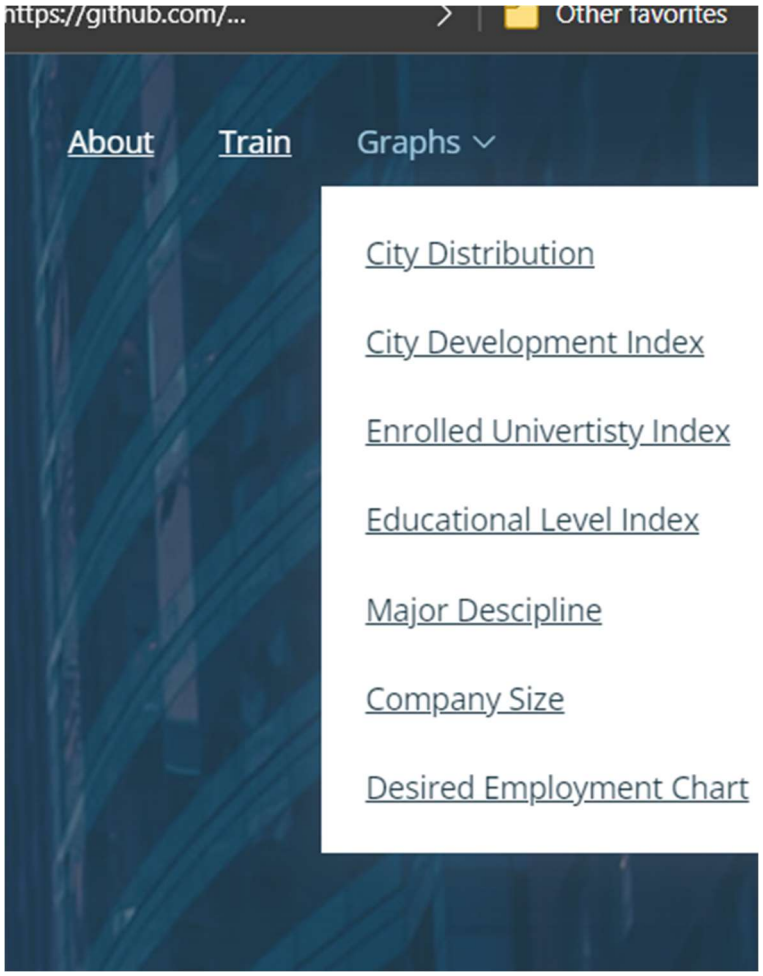
https://github.com/...
Other favorites
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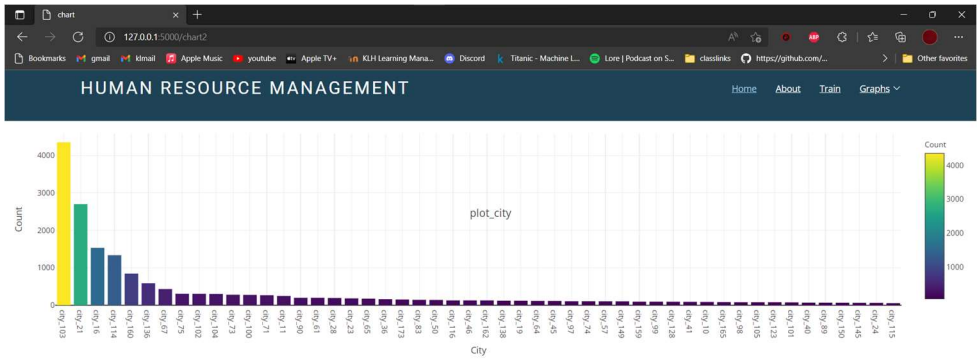
chart
127.0.0.1:5000/chart2
Bookmarks
gmail
klmail
Apple Music
youtube
Apple TV+
KLH Learning Mana...
Discord
Titanic - Machine L...
Lore | Podcast on S...
classlinks
https://github.com/...
Other favorites
HUMAN RESOURCE MANAGEMENT
Home
About
Train
Graphs
plot_city
Count
City
4000
3000
2000
1000
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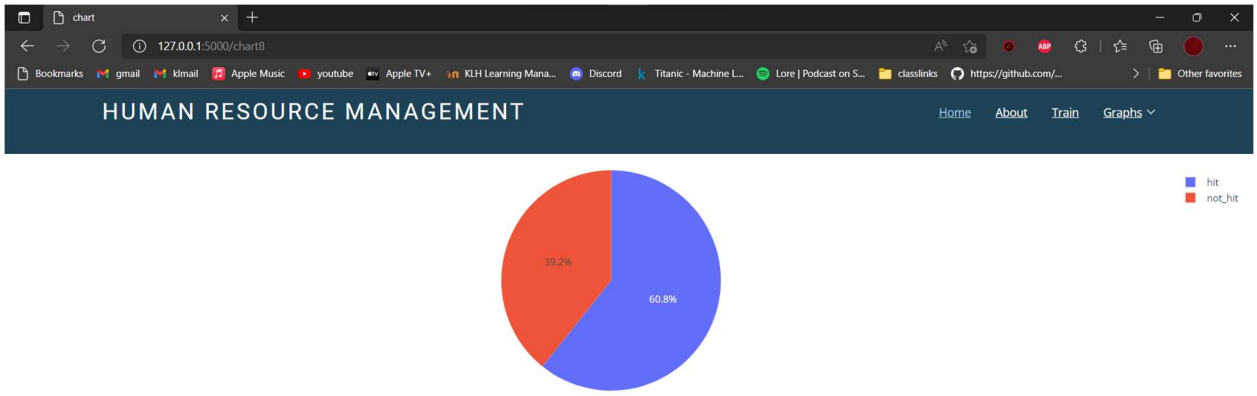
chart
127.0.0.1:5000/chart8
Bookmarks
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Apple Music
youtube
Apple TV+
KLH Learning Mana...
Discord
Titanic - Machine L...
Lore | Podcast on S...
classlinks
https://github.com/...
Other favorites
HUMAN RESOURCE MANAGEMENT
Home
About
Train
Graphs
hit
not_hit
39.2%
60.8%