

TRACING THE GROWTH OF THE GLOBAL COMMUNITY
A POPULATION FORECASTING ANALYSIS

Project submitted to



NAAN MUDHALVAN
A MASSIVE UPSKILLING PROGRAM

MANONMANIAM SUNDARANAR UNIVERSITY

In Partial Fulfillment of the requirements for the degree of

BACHELOR OF SCIENCE IN MATHEMATICS

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APRIL- 2023

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1.1 OVERVIEW:

Population growth is the increase in the number of humans on Earth. For most of human history our population size was relatively stable. But with innovation and industrialization, energy, food, water, and medical care became more available and reliable. Consequently, global human population rapidly increased, and continues to do so, with dramatic impacts on global climate and ecosystems. We will need technological and social innovation to help us support the world's population as we adapt to and mitigate climate and environmental changes.

1.2 PURPOSE:

Population forecasting is a method to predict/forecast the future population of an area. Usually, the population at the design period of water supply systems is predicted to find the water demand at that time as the systems are required to fulfill their purposes till the end of the design period.

1. Estimate the basic need for human, such as demand for food, water, power, transportations.
2. Plan constructions such as housing, highways etc.
3. Estimate the labor forces in various places.
4. Estimate the potential consumptions in various regions.
5. Benefit sociological research, such as providing data about sex ratio or age ratio.

2. Problem Definition & Design Thinking

2

2.1 Empathy map:

Template



Empathy map

Use this framework to develop a deep, shared understanding and empathy for other people. An empathy map helps describe the aspects of a user's experience, needs and pain points, to quickly understand your users' experience and mindset.

Share template feedback



Need some inspiration?
See a finished version of this template to kickstart your work.
[Open example](#)

Build empathy

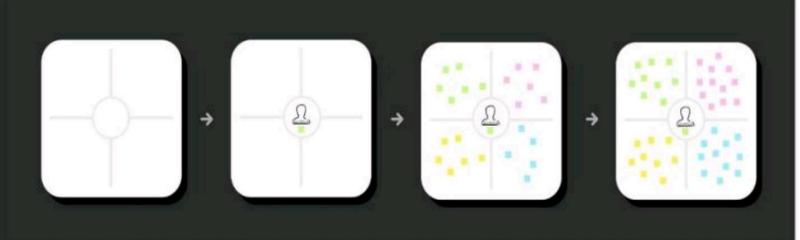
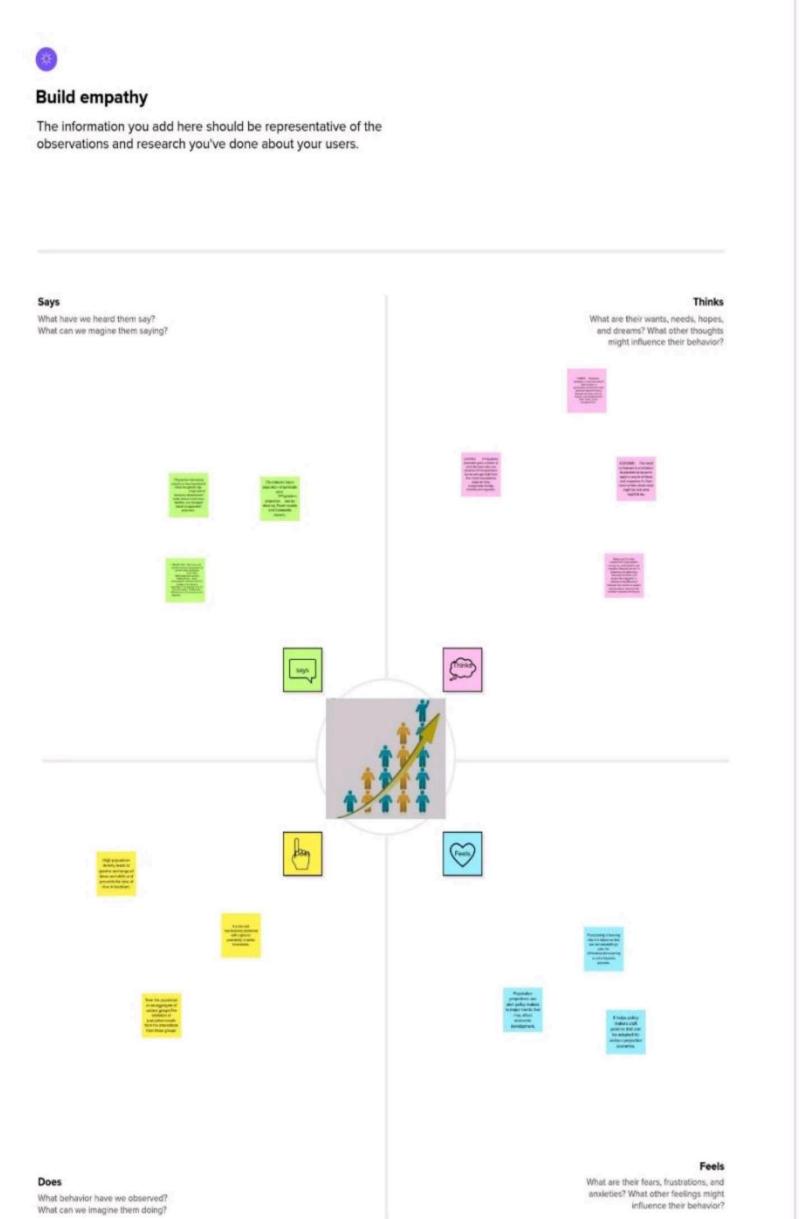
The information you add here should be representative of the observations and research you've done about your users.

Says
What have we heard them say?
What can we imagine them saying?

Thinks
What are their wants, needs, hopes, and dreams? What other thoughts might influence their behavior?

Does
What behavior have we observed?
What can we imagine them doing?

Feels
What are their fears, frustrations, and anxieties? What other feelings might influence their behavior?



2.2 Ideation & Brainstorming Map:

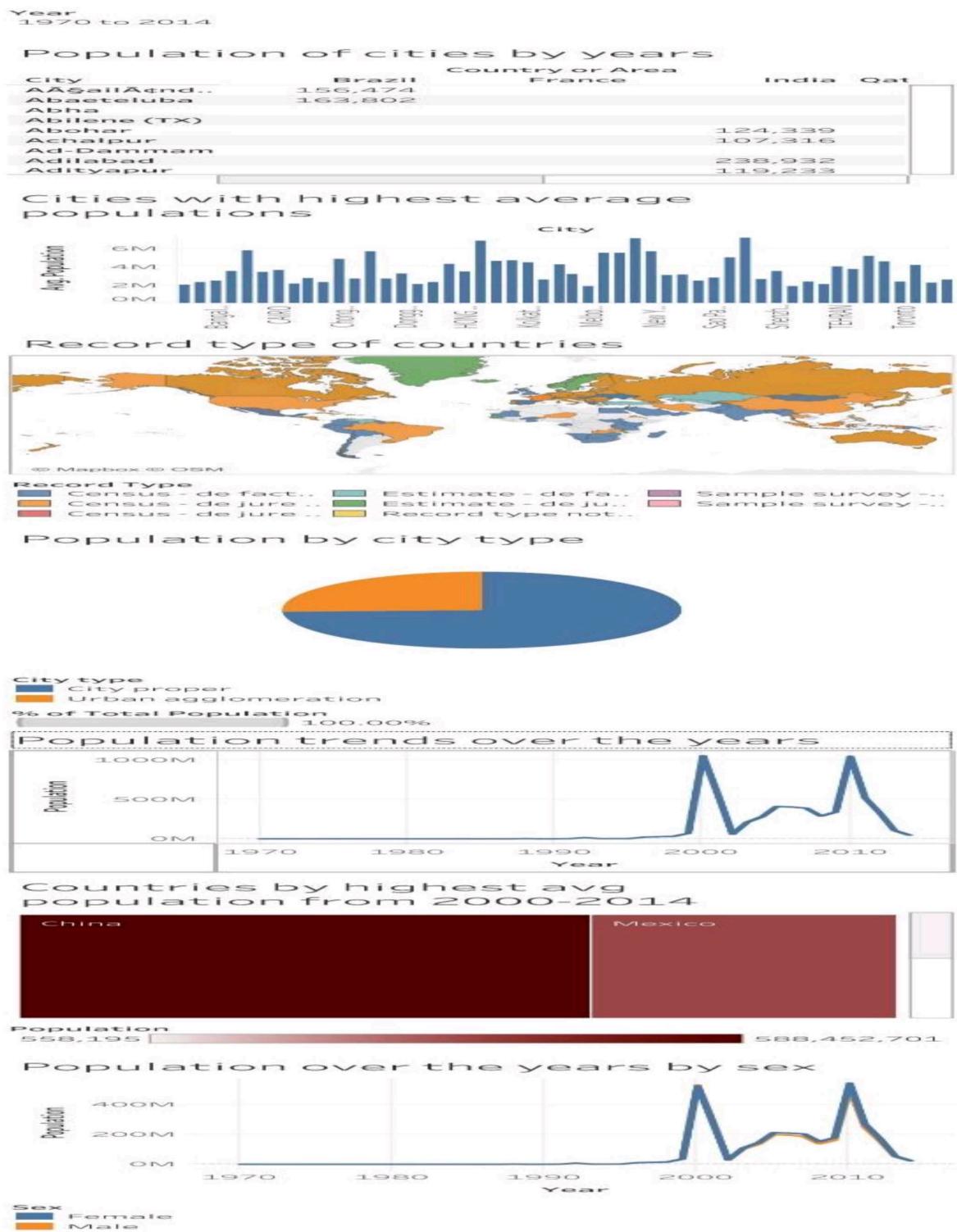
3



3. RESULT:

4

Dashboard of population forecasting analysis



Story of population forecasting analysis

5

Story 1

It shows the population city types	It shows the population of cities by years	It shows the countries with highest avg population from 2000-2014	It shows the cities with highest average population	Population trends over the years by ..
------------------------------------	--	---	---	--

City	Country or Area							Year 1970 to 2014
	Brazil	France	India	Qatar	Saudi Arabia	Singapore	United Stat..	
AÄ§ailÄ¢ndia	156,474							
Abaeteluba	163,802							
Abha					314,060			
Abilene (TX)							232,993	
Abohar			124,339					
Achalpur			107,316					
Ad-Dammam					1,226,438			
Adilabad			238,932					
Adityapur			119,233					
Adoni			319,763					
Agartala			189,998					
Agra			2,606,473					
Aguas Lindas de GoiÄis	318,276							
Ahmedabad			8,045,098					
Ahmednagar			655,164					
Aix-en-Provence	275,762							
Aizawl			228,280					
Ajmer			976,095					
Akola			400,520					
Akron (OH)							986,399	
Al-Hawiyah				132,078				
Al-Hufuf				513,681				
Al-Jubayl				222,544				
Al-Kharj				349,645				
Al-Khoor			502,766					
Al-Khubar				308,780				
Al-Madinah				1,528,207				
Al-Mubarraz				504,164				
Al-Qurrayyat				100,436				
Al-Rayyan			1,737,430					
Al-Wakrah			141,222					
Alagoinhas	246,366							
Alandur			146,287					
Alappuzha			459,704					
Albuquerque (NM)					1,592,650			
Alexandria (VA)						268,249		
Aligarh			669,087					
Alipurduar			114,035					

4. ADVANTAGES & DISADVANTAGES

6

ADVANTAGES OF POPULATION FORECASTING

Gaining insight is a must for operations that are seeking to generate adequate forecasts. Forecasting gets you into the habit of looking at the past and real-time data to predict future demand. While doing this, you will be able to anticipate demand fluctuations more effectively. It also will provide insight into your company's supply chain health and provide you with an opportunity to make any corrections or adjustments based off of new information that is received through real-time data.

DISADVANTAGES OF POPULATION FORECASTING

Forecasts are Never Completely Accurate – Forecasts are never 100% and it is almost impossible to predict the future with certainty. Even if you have a great process in place and forecasting experts on your payroll, your forecasts will never be spot on. Some products and markets will have a high level of volatility, especially during times of crisis. The coronavirus has definitely enhanced and increased this volatility within the market – which is why understanding what factors influence your demand can potentially aid with developing forecasts during this time. Having said that, the main drawback of forecasts are that they are almost always wrong which leads to excess or shortage of inventory.

THE NEED FOR FORECASTING POPULATION

In the solution of any planning problem, the planner either makes an explicit forecast, or makes some implicit assumption about the population for which he is planning. "Population" includes much more than mere numbers of people. The planner must know what kind of people live in his planning area, what types of lives they lead, and would like to lead, how long they will live, and how long they will reside in the particular area; and who will replace them when they move out or die; how many children they will have (and would like to have under different conditions), whether these children will live in the area, and many other factors.

6. CONCLUSIONS

Population Projections are important only when they are for short period. The projections for long period are possible only in a static economy. When the economy is dynamic, and social, political and external factors affect it, the projections are rarely true. Pravin Visaria has shown that all projections in 1961 regarding India and Pakistan proved to be false. This does not mean that projections should not be made or used.

7. FUTURE SCOPE: 8

Central and local finance allocation;

Informing local and national policy;

Childcare and schools planning;

Housing and land use planning;

Health care planning;

Modelling and projecting health care indicators;

Weighting surveys;

Benchmarking other projections and as a control for

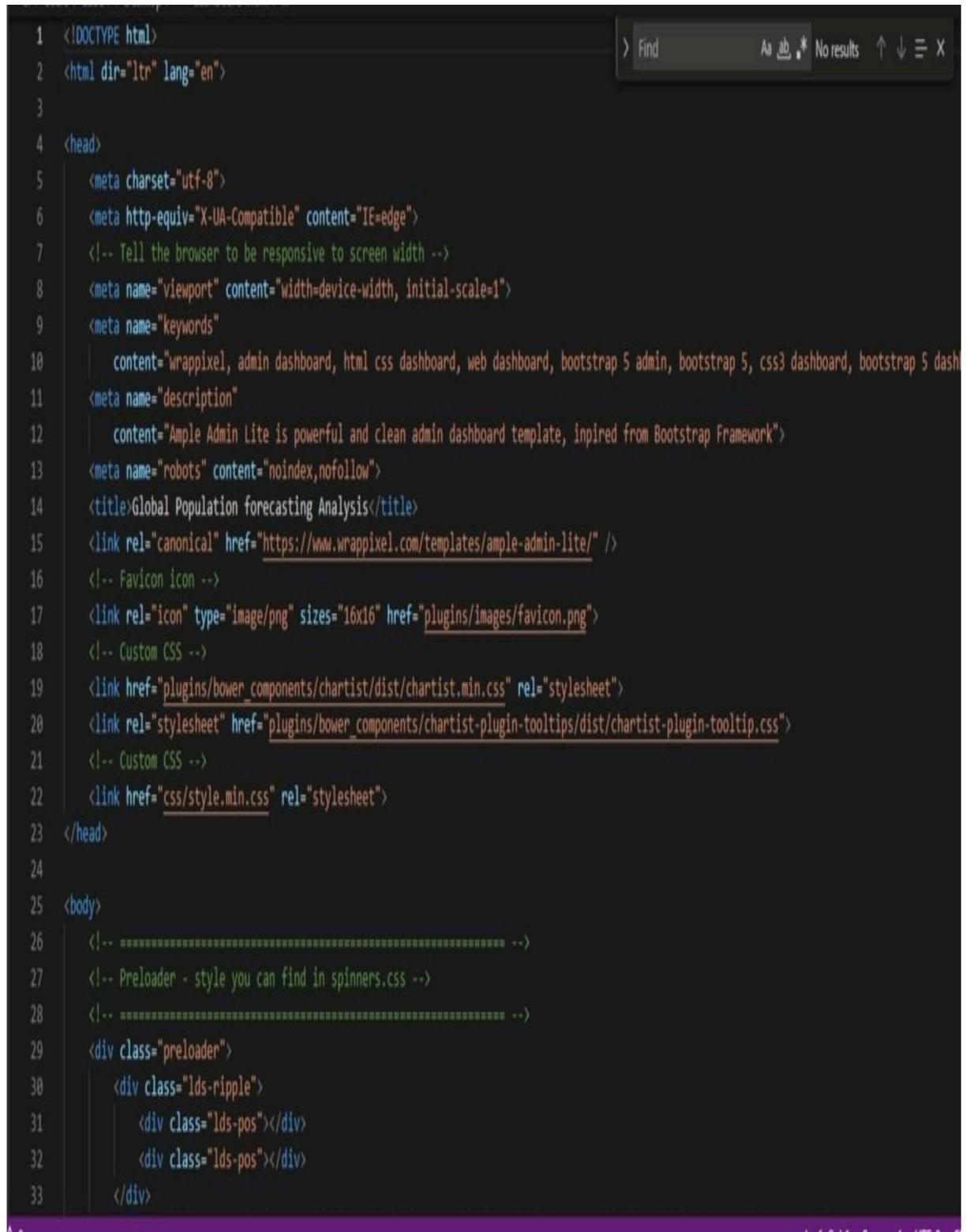
smaller area projections;

Looking at the implications of an ageing population;

Making national and international comparisons.

Source code: <file:///C:/Users/ELCOT/Desktop/dashboard.html>

Source code:



```
1 <!DOCTYPE html>
2 <html dir="ltr" lang="en">
3
4 <head>
5   <meta charset="utf-8">
6   <meta http-equiv="X-UA-Compatible" content="IE=edge">
7   <!-- Tell the browser to be responsive to screen width -->
8   <meta name="viewport" content="width=device-width, initial-scale=1">
9   <meta name="keywords"
10     content="wrappixel, admin dashboard, html css dashboard, web dashboard, bootstrap 5 admin, bootstrap 5, css3 dashboard, bootstrap 5 dash
11   <meta name="description"
12     content="Ample Admin Lite is powerful and clean admin dashboard template, inspired from Bootstrap Framework">
13   <meta name="robots" content="noindex,nofollow">
14   <title>Global Population forecasting Analysis</title>
15   <link rel="canonical" href="https://www.wrappixel.com/templates/ample-admin-lite/" />
16   <!-- Favicon icon -->
17   <link rel="icon" type="image/png" sizes="16x16" href="plugins/images/favicon.png">
18   <!-- Custom CSS -->
19   <link href="plugins/bower_components/chartist/dist/chartist.min.css" rel="stylesheet">
20   <link rel="stylesheet" href="plugins/bower_components/chartist-plugin-tooltip/dist/chartist-plugin-tooltip.css">
21   <!-- Custom CSS -->
22   <link href="css/style.min.css" rel="stylesheet">
23 </head>
24
25 <body>
26   <!-- ====== -->
27   <!-- Preloader - style you can find in spinners.css -->
28   <!-- ====== -->
29   <div class="preloader">
30     <div class="lds-ripple">
31       <div class="lds-pos"></div>
32       <div class="lds-pos"></div>
33     </div>
```

```
32     <div class="lds-pos"></div>
33   </div>
34 <!-- ===== -->
35 <!-- Main wrapper - style you can find in pages.scss -->
36 <!-- ===== -->
37 <div id="main-wrapper" data-layout="vertical" data-navbarbg="skin5" data-sidebar-type="full"
38   data-sidebar-position="absolute" data-header-position="absolute" data-boxed-layout="full">
39   <!-- ===== -->
40   <!-- Topbar header - style you can find in pages.scss -->
41   <!-- ===== -->
42   <header class="topbar" data-navbarbg="skin5">
43     <nav class="navbar top-navbar navbar-expand-md navbar-dark">
44       <div class="navbar-header" data-logobg="skin6">
45         <!-- ===== -->
46         <!-- Logo -->
47         <!-- ===== -->
48         <a class="navbar-brand" href="#">dashboard.html>
49           <!-- Logo icon -->
50           <b class="logo-icon">
51             <!-- Dark Logo icon -->
52             
53           </b>
54           <!-- End Logo icon -->
55           <!-- Logo text -->
56           <span class="logo-text">
57             <!-- dark Logo text -->
58             
59           </span>
60         </a>
61         <!-- ===== -->
62         <!-- End Logo -->
63         <!-- ===== -->
```

```
C:\> Users > ELCOT > Desktop > dashboard.html > ...  
63      <!-- End Logo -->  
64      <!-- ===== -->  
65      <!-- ===== -->  
66      <!-- toggle and nav items -->  
67      <!-- ===== -->  
68      <a class="nav-toggler waves-effect waves-light text-dark d-block d-md-none"  
69          href="javascript:void(0)"><i class="ti-menu ti-close"></i></a>  
70    </div>  
71    <!-- ===== -->  
72    <!-- End Logo -->  
73    <!-- ===== -->  
74    <div class="navbar-collapse collapse" id="navbarSupportedContent" data-navbarbg="skin5">  
75  
76        <!-- ===== -->  
77        <!-- Right side toggle and nav items -->  
78        <!-- ===== -->  
79        <ul class="navbar-nav ms-auto d-flex align-items-center">  
80  
81            <!-- ===== -->  
82            <!-- Search -->  
83            <!-- ===== -->  
84            <li class="in">  
85                <form role="search" class="app-search d-none d-md-block me-3">  
86                    <input type="text" placeholder="Search..." class="form-control mt-0">  
87                    <a href="#" class="active">  
88                        <i class="fa fa-search"></i>  
89                    </a>  
90                </form>  
91            </li>  
92            <!-- ===== -->  
93            <!-- User profile and search -->  
94            <!-- ===== -->  
95            <li>
```

```
94      <!-- ----->
95      <li>
96          <a class="profile-pic" href="#">
97              <span class="text-white font-medium">Muhsina Shareefa</span></a>
99      </li>
100     <!-- ----->
101     <!-- User profile and search -->
102     <!-- ----->
103     </ul>
104   </div>
105 </nav>
106 </header>
107 <!-- ----->
108 <!-- End Topbar header -->
109 <!-- ----->
110 <!-- ----->
111 <!-- Left Sidebar - style you can find in sidebar.scss -->
112 <!-- ----->
113 <aside class="left-sidebar" data-sidebarbg="skin6">
114     <!-- Sidebar scroll-->
115     <div class="scroll-sidebar">
116         <!-- Sidebar navigation-->
117         <nav class="sidebar-nav">
118             <ul id="sidebarnav">
119                 <!-- User Profile-->
120                 <li class="sidebar-item pt-2">
121                     <a class="sidebar-link waves-effect waves-dark sidebar-link" href="dashboard.html"
122                         aria-expanded="false">
123                         <i class="far fa-clock" aria-hidden="true"></i>
124                         <span class="hide-menu">Visualizations</span>
125                     </a>
126                 </li>
```

```
C:\Users>ELCOT>Desktop> dashboard.html > ...
125
126    </li>
127
128    <li class="sidebar-item">
129        <a class="sidebar-link waves-effect waves-dark sidebar-link" href="profile.html"
130            aria-expanded="false">
131            <i class="fa fa-user" aria-hidden="true"></i>
132            <span class="hide-menu">Profile</span>
133        </a>
134    </li>
135
136    <li class="sidebar-item">
137        <a class="sidebar-link waves-effect waves-dark sidebar-link" href="story.html"
138            aria-expanded="false">
139            <i class="fa fa-table" aria-hidden="true"></i>
140            <span class="hide-menu">Story</span>
141        </a>
142
143        <li class="sidebar-item">
144            <a class="sidebar-link waves-effect waves-dark sidebar-link" href="dash1.html"
145                aria-expanded="false">
146                <i class="fa fa-table" aria-hidden="true"></i>
147                <span class="hide-menu">Dashboard</span>
148            </a>
149
150
151        <!-- <li class="text-center p-20 upgrade-btn">
152            <a href="https://www.wrappixel.com/templates/ampleadmin/"
153                class="btn d-grid btn-danger text-white" target="_blank">
154                Upgrade to Pro</a>
155            </li> -->
156
157    </ul>
```

```
C:\> Users > ELCOT > Desktop > dashboard.html > ...
```

```
157     </nav>
158     <!-- End Sidebar navigation -->
159   </div>
160   <!-- End Sidebar scroll-->
161   </aside>
162   <!-- ===== -->
163   <!-- End Left Sidebar - style you can find in sidebar.scss -->
164   <!-- ===== -->
165   <!-- ===== -->
166   <!-- Page wrapper -->
167   <!-- ===== -->
168   <div class="page-wrapper">
169     <!-- ===== -->
170     <!-- Bread crumb and right sidebar toggle -->
171     <!-- ===== -->
172     <div class="page-breadcrumb bg-white">
173       <div class="row align-items-center">
174         <div class="col-lg-3 col-md-4 col-sm-4 col-xs-12">
175           <h4 class="page-title">Dashboard</h4>
176         </div>
177         <div class="col-lg-9 col-sm-8 col-md-8 col-xs-12">
178           <div class="d-md-flex">
179             <ol class="breadcrumb ms-auto">
180               <li><a href="#" class="fw-normal">Dashboard</a></li>
181             </ol>
182             <a href="https://www.un.org/development/desa/pd/" target="_blank"
183               class="btn btn-danger d-none d-md-block pull-right ms-3 hidden-xs hidden-sm waves-effect waves-light text-white">
184               Website</a>
185             </div>
186           </div>
187         </div>
188       </div>
189     <!-- /.col-lg-12 -->
```

```
> Users > ELCOT > Desktop > dashboard.html > ...
8   </div>
9     <!-- /.col-lg-12 -->
10    </div>
11    <!-- ===== -->
12    <!-- End Bread crumb and right sidebar toggle -->
13    <!-- ===== -->
14    <!-- ===== -->
15    <!-- Container fluid -->
16    <!-- ===== -->
17    <div class="container-fluid">
18      <!-- ===== -->
19      <!-- Three charts -->
20      <!-- ===== -->
21
22      <!-- ===== -->
23      <!-- PRODUCTS YEARLY SALES -->
24      <!-- ===== -->
25      <div class='tableauPlaceholder' id='viz1681509823918' style='position: relative'><noscript><a href='#'><img alt='Dashboard 4 ' src='https://public.tableau.com/javascripts/api/viz_v1.js?embed=true&vizi...</a></noscript></div>
26      <div class='tableauPlaceholder' id='viz1681514448087' style='position: relative'><noscript><a href='#'><img alt='Story 1 ' src='https://public.tableau.com/javascripts/api/viz_v1.js?embed=true&vizi...</a></noscript></div>
27
28      <!-- ===== -->
29      <!-- Recent Comments -->
30      <!-- ===== -->
31
32      <!-- ===== -->
33      <!-- End Container fluid -->
34      <!-- ===== -->
35      <!-- ===== -->
36      <!-- footer -->
37      <!-- ===== -->
38      <footer class="footer text-center"> 2022 © Smartinternz brought to you by <a
39          | href="https://www.thesmarbridge.com/">thesmarbridge.com</a>
40      </footer>
41
```

```
222 |     <!-- End footer -->
223 |     <!-- ===== -->
224 |     </div>
225 |     <!-- ===== -->
226 |     <!-- End Page wrapper -->
227 |     <!-- ===== -->
228 |     </div>
229 |     <!-- ===== -->
230 |     <!-- End Wrapper -->
231 |     <!-- ===== -->
232 |     <!-- ===== -->
233 |     <!-- All Jquery -->
234 |     <!-- ===== -->
235 |     <script src="plugins/bower_components/jquery/dist/jquery.min.js"></script>
236 |     <!-- Bootstrap tether Core JavaScript -->
237 |     <script src="bootstrap/dist/js/bootstrap.bundle.min.js"></script>
238 |     <script src="js/app-style-switcher.js"></script>
239 |     <script src="plugins/bower_components/jquery-sparkline/jquery.sparkline.min.js"></script>
240 |     <!--Wave Effects -->
241 |     <script src="js/waves.js"></script>
242 |     <!--Menu sidebar -->
243 |     <script src="js/sidebarmenu.js"></script>
244 |     <!--Custom JavaScript -->
245 |     <script src="js/custom.js"></script>
246 |     <!--This page JavaScript -->
247 |     <!--chartis chart-->
248 |     <script src="plugins/bower_components/chartist/dist/chartist.min.js"></script>
249 |     <script src="plugins/bower_components/chartist-plugin-tooltips/dist/chartist-tooltip.min.js"></script>
250 |     <script src="js/pages/dashboards/dashboard1.js"></script>
251 |   </body>
252 |
253 | </html>
```