

## APPENDIX

### APPENDIX A: PYTHON SEABORN PROGRAMMING

**Syntax for Heatmap showing the normalized pair-wise relative intensities of criteria**

```
In [1]:
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

%matplotlib inline
%reload_ext autoreload
%autoreload 2

In [2]:
ahp_normalized_pairwise_matrix_df = pd.read_csv('AHP Normalized
Pairwise Matrix.csv', index_col='Criteria')

In [3]:
ahp_normalized_pairwise_matrix_df                                =
ahp_normalized_pairwise_matrix_df.dropna()

In [4]:
ahp_normalized_pairwise_matrix_df

In [5]:
plt.rcParams['font.family'] = 'serif'
plt.rcParams['font.serif']   = ['Times New Roman'] +
plt.rcParams['font.serif']

In [6]:
plt.figure(figsize=(9,7))
sns.set_context('paper', font_scale=1.3)
ax = sns.heatmap(ahp_normalized_pairwise_matrix_df, annot=True,
cmap='Blues', linecolor='white', linewidth=1)
ax.invert_yaxis()
plt.ylabel('')
```

**Seaborn Python Syntax for Analytical hierarchy process heat map showing the performance of hospitals against each criterion**

```
In [1]:
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

%matplotlib inline
%reload_ext autoreload
%autoreload 2
```

```
In [2]:
ahp_priorities_by_alternative_df = pd.read_csv('AHP Priorities
by alternative.csv', index_col='Criteria')
```

```
In [3]:
plt.rcParams['font.family'] = 'serif'
plt.rcParams['font.serif'] = ['Times New Roman'] +
plt.rcParams['font.serif']
```

```
In [4]:
plt.figure(figsize=(9,7))
sns.set_context('paper', font_scale=1.3)
```

```
In [5]:
ax = sns.heatmap(ahp_priorities_by_alternative_df, annot=False,
cmap='Blues', linecolor='white', linewidth=0)
ax.invert_yaxis()
plt.ylabel('')
```

### **Seaborn Python Syntax for Fuzzy AHP Hierarchical clustering map showing the performance of hospitals against each criterion**

```
In [1]:
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

```
%matplotlib inline
%reload_ext autoreload
%autoreload 2
```

```
In [2]:
fuzzy_ahp_priorities_by_alternative_df = pd.read_csv('Fuzzy AHP
Priorities by alternative.csv', index_col='Criteria')
```

```
In [3]:
plt.rcParams['font.family'] = 'serif'
plt.rcParams['font.serif'] = ['Times New Roman'] +
plt.rcParams['font.serif']
```

```
In [4]:
plt.figure(figsize=(6,13))
sns.set_context('paper', font_scale=1.3)
```

```
In [5]:
sns.clustermap(fuzzy_ahp_priorities_by_alternative_df,
cmap='Blues', standard_scale=1)
plt.ylabel('Hospital')
```

## Seaborn Python Syntax for Needle stick injuries recorded by health and waste workers

*In [1]:*

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

```
%matplotlib inline
%reload_ext autoreload
%autoreload 2
```

*In [2]:*

```
needle_stick_injury_df = pd.read_csv('Needle Stick Injury.csv',
index_col='No')
```

*In [3]:*

```
plt.rcParams['font.family'] = 'serif'
plt.rcParams['font.serif'] = ['Times New Roman'] +
plt.rcParams['font.serif']
```

*In [4]:*

```
plt.figure(figsize=(30,10))
sns.set_context('paper', font_scale=1.8)
```

*In [5]:*

```
sns.boxplot(x='Health Facility', y='Needle Stick Injury',
data=needle_stick_injury_df, hue='Gender', palette='Blues')
plt.xlabel('Health Facilities')
plt.legend(loc=0)
```