In [18]:
```
# This Python 3 environment comes with many helpful analytics libraries installed
# It is defined by the kaggle/python Docker image: https://github.com/kaggle/docker-python
# For example, here's several helpful packages to load
import warnings
import matplotlib.pyplot as plt
warnings.filterwarnings("ignore")
import seaborn as sns
import numpy as np # linear algebra
import pandas as pd # data processing, CSV file I/O (e.g. pd.read_csv)

# Input data files are available in the read-only "../input/" directory
# For example, running this (by clicking run or pressing Shift+Enter) will list all files under the input directory

import os
for dirname, _, filenames in os.walk('/kaggle/input'):
    for filename in filenames:
        print(os.path.join(dirname, filename))

# You can write up to 20GB to the current directory (/kaggle/working/) that gets preserved as output when you create a version using "Save & Run All"
# You can also write temporary files to /kaggle/temp/, but they won't be saved outside of the current session
```

```
/kaggle/input/pokemon/pokemon.csv
```

In [19]:
```
df = pd.read_csv("/kaggle/input/pokemon/pokemon.csv")
df.head(3)
```

Out[19]:

	abilities	against_bug	against_dark	against_dragon	against_electric	against_fairy	against
0	['Overgrow', 'Chlorophyll']	1.0	1.0	1.0	0.5	0.5	
1	['Overgrow', 'Chlorophyll']	1.0	1.0	1.0	0.5	0.5	
2	['Overgrow', 'Chlorophyll']	1.0	1.0	1.0	0.5	0.5	

3 rows × 41 columns

In [20]:
```
df.generation.unique()
```

Out[20]:
```
array([1, 2, 3, 4, 5, 6, 7])
```

In [21]:
```
#df.abilities.unique()
```

In [22]:
```
df.isna().sum()
```

Out[22]:
```
abilities              0
against_bug            0
against_dark           0
against_dragon         0
against_electric       0
against_fairy          0
against_fight          0
against_fire           0
against_flying         0
against_ghost          0
against_grass          0
against_ground         0
against_ice            0
against_normal         0
against_poison         0
against_psychic        0
against_rock           0
against_steel          0
against_water          0
attack                 0
base_egg_steps         0
base_happiness         0
base_total             0
capture_rate           0
classfication          0
defense                0
experience_growth      0
height_m              20
hp                     0
japanese_name          0
name                   0
percentage_male       98
pokedex_number         0
sp_attack              0
sp_defense             0
speed                  0
type1                  0
type2                384
weight_kg             20
generation             0
is_legendary           0
dtype: int64
```

In [23]:
```
df.shape
```

Out[23]:
```
(801, 41)
```

In [24]:

```
# creating dataframe for columns to vizuallize
data = df[['type1','type2','attack','defense','speed']]
data
```

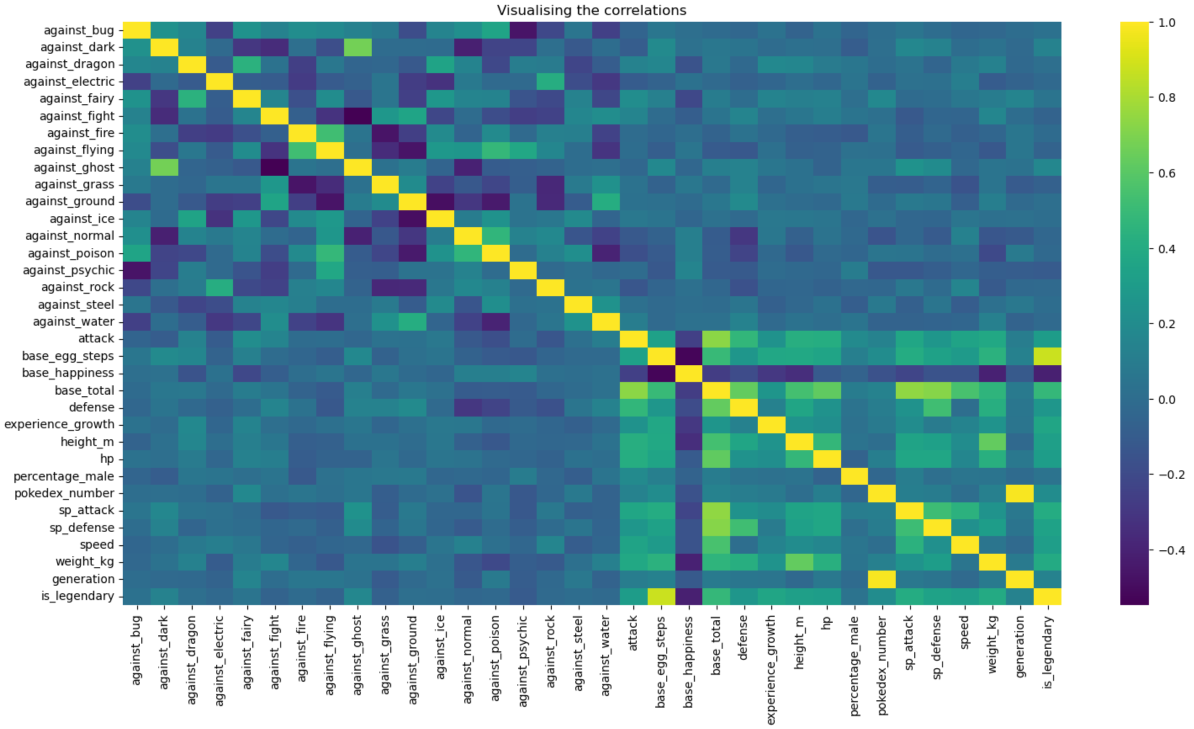
Out[24]:

```
       type1   type2  attack  defense  speed
  0    grass  poison      49       49     45
  1    grass  poison      62       63     60
  2    grass  poison     100      123     80
  3     fire     NaN      52       43     65
  4     fire     NaN      64       58     80
...      ...     ...     ...      ...    ...
796    steel  flying     101      103     61
797    grass   steel     181      131    109
798     dark  dragon     101       53     43
799  psychic     NaN     107      101     79
800    steel   fairy      95      115     65

801 rows × 5 columns
```

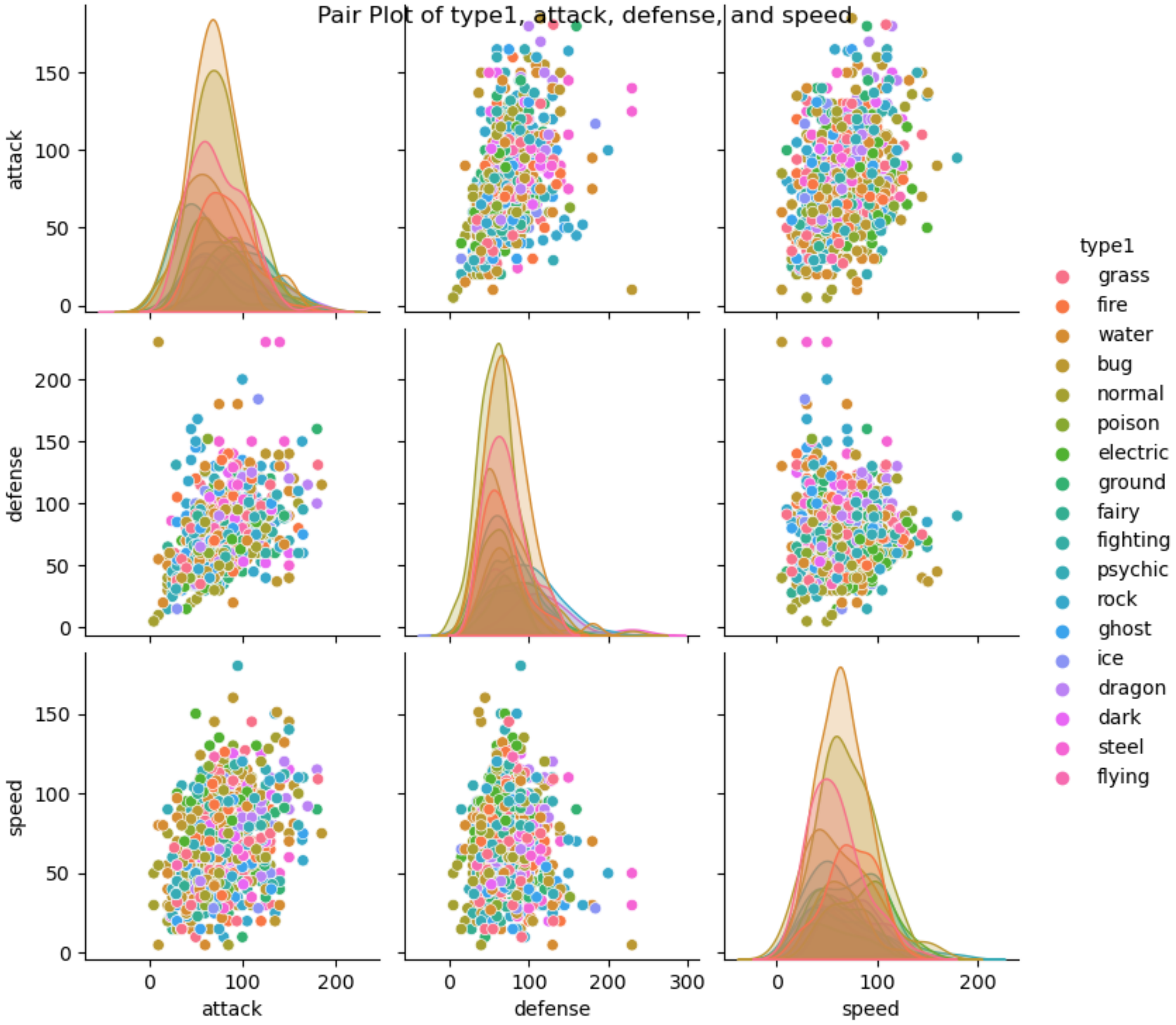
In [25]:

```
plt.figure(figsize=(18,9))
sns.heatmap(df.corr(),cmap='viridis')
plt.title('Visualising the correlations')
plt.show()
```



```
In [26]: temp = df[['type1', 'type2', 'attack', 'defense', 'speed']]
         plt.figure(figsize=(20,20))
         sns.pairplot(temp,hue='type1')
         plt.suptitle('Pair Plot of type1, attack, defense, and speed')
         plt.show()
```

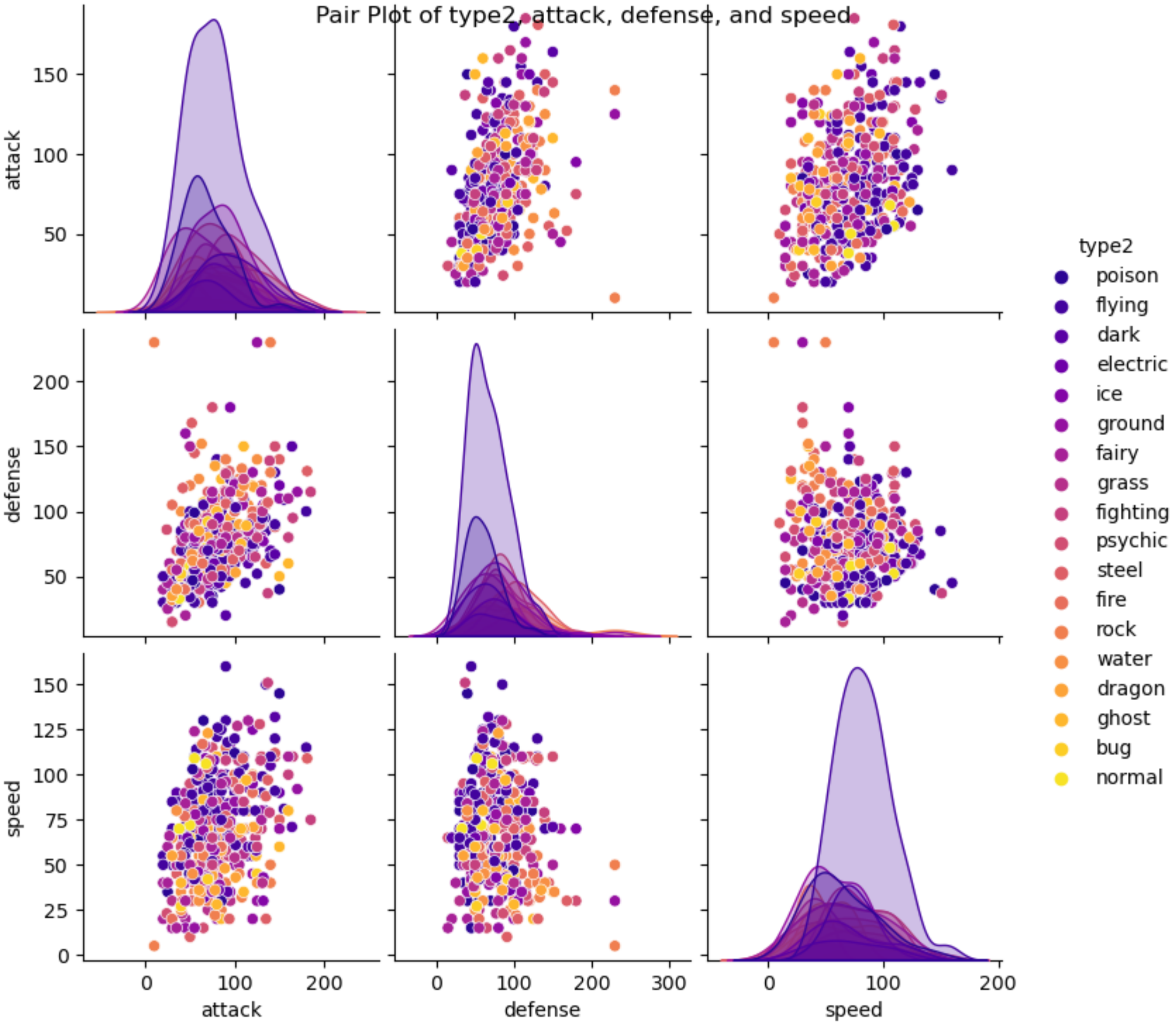
```
<Figure size 2000x2000 with 0 Axes>
```



In [27]:

```
plt.figure(figsize=(20,20))
sns.pairplot(temp,hue='type2',palette='plasma')
plt.suptitle('Pair Plot of type2, attack, defense, and speed')
plt.show()
```

```
<Figure size 2000x2000 with 0 Axes>
```

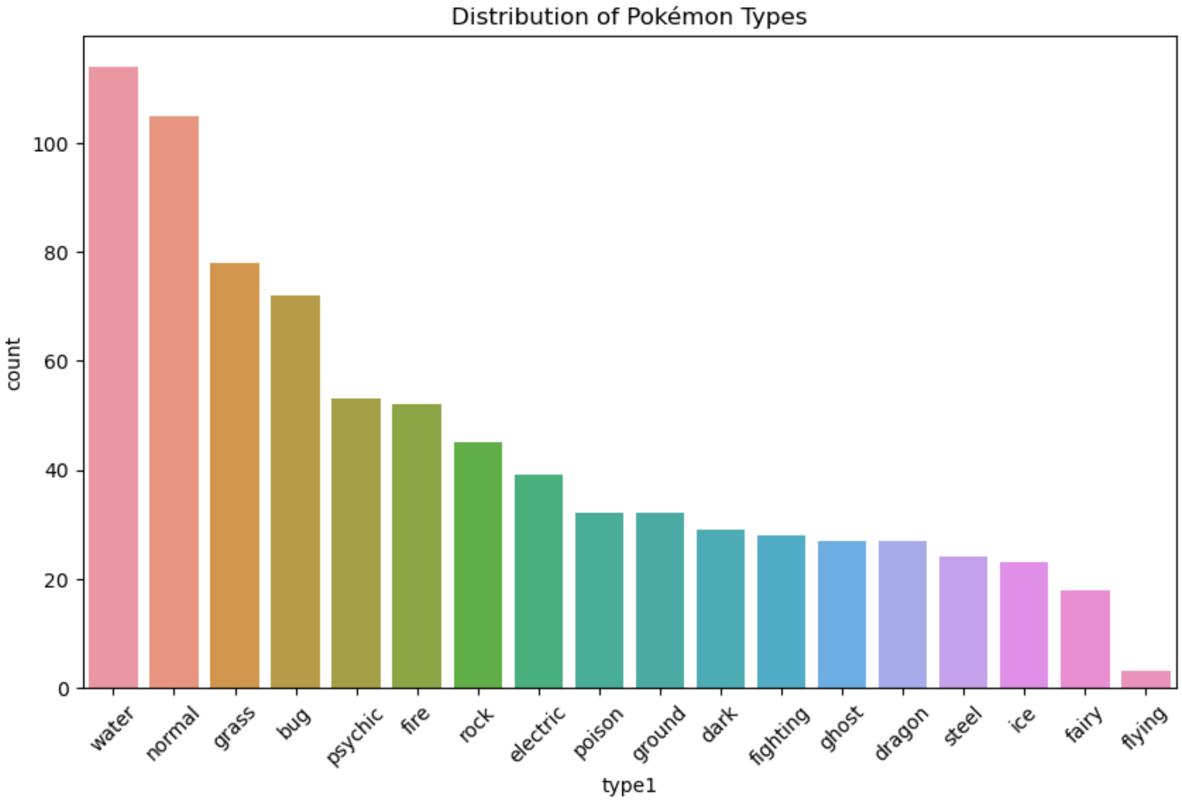


Task 2

In [28]:

```
# 1. Distribution of Pokémon types and the most common type
type_counts = df['type1'].value_counts()
most_common_type = type_counts.idxmax()
print("Most Common Pokémon Type:", most_common_type)
plt.figure(figsize=(10, 6))
sns.countplot(data=df, x='type1', order=type_counts.index)
plt.title("Distribution of Pokémon Types")
plt.xticks(rotation=45)
plt.show()
```

```
Most Common Pokémon Type: water
```



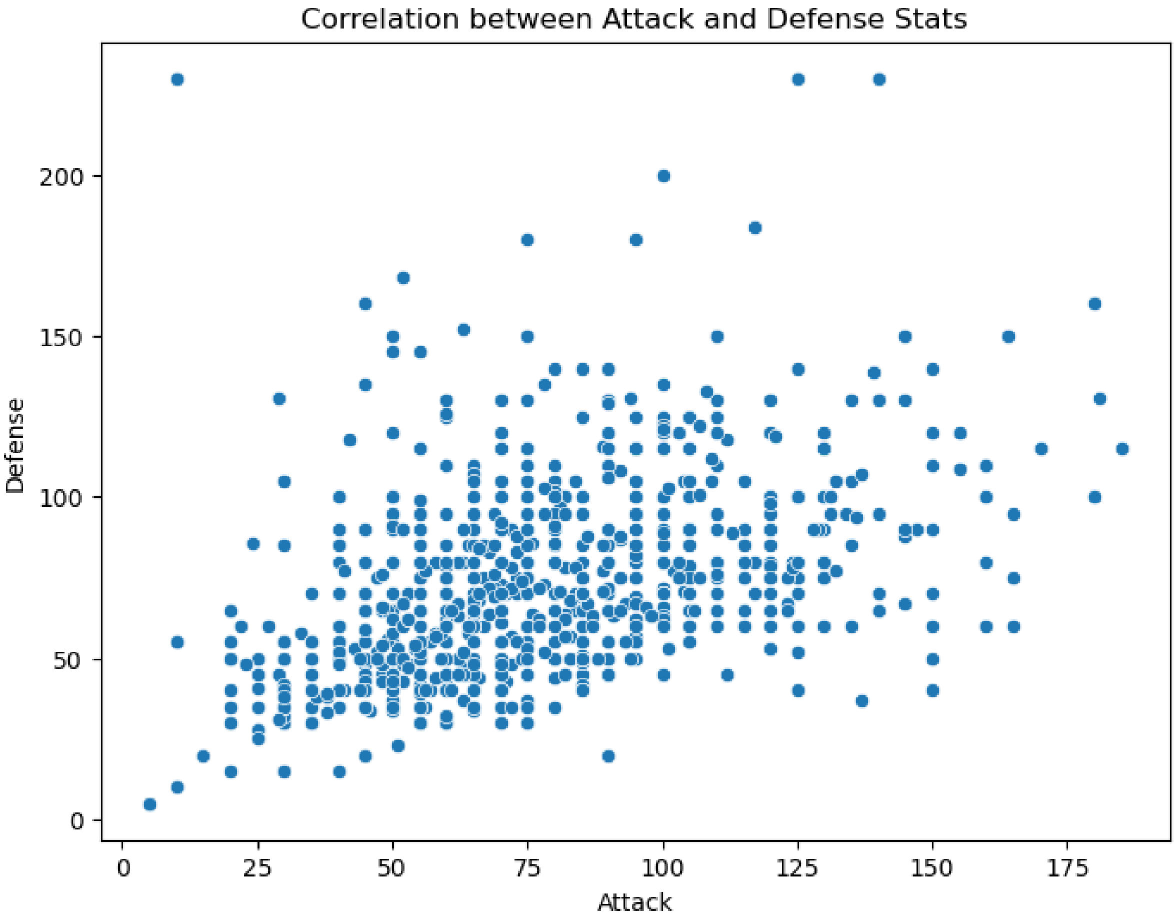
In [29]:

```
print(df.columns)
```

```
Index(['abilities', 'against_bug', 'against_dark', 'against_dragon',
       'against_electric', 'against_fairy', 'against_fight', 'against_fire',
       'against_flying', 'against_ghost', 'against_grass', 'against_ground',
       'against_ice', 'against_normal', 'against_poison', 'against_psychic',
       'against_rock', 'against_steel', 'against_water', 'attack',
       'base_egg_steps', 'base_happiness', 'base_total', 'capture_rate',
       'classfication', 'defense', 'experience_growth', 'height_m', 'hp',
       'japanese_name', 'name', 'percentage_male', 'pokedex_number',
       'sp_attack', 'sp_defense', 'speed', 'type1', 'type2', 'weight_kg',
       'generation', 'is_legendary'],
      dtype='object')
```

In [30]:

```
plt.figure(figsize=(8, 6))
sns.scatterplot(data=df, x='attack', y='defense')
plt.title("Correlation between Attack and Defense Stats")
plt.xlabel('Attack')
plt.ylabel('Defense')
plt.show()
```



In [ ]:

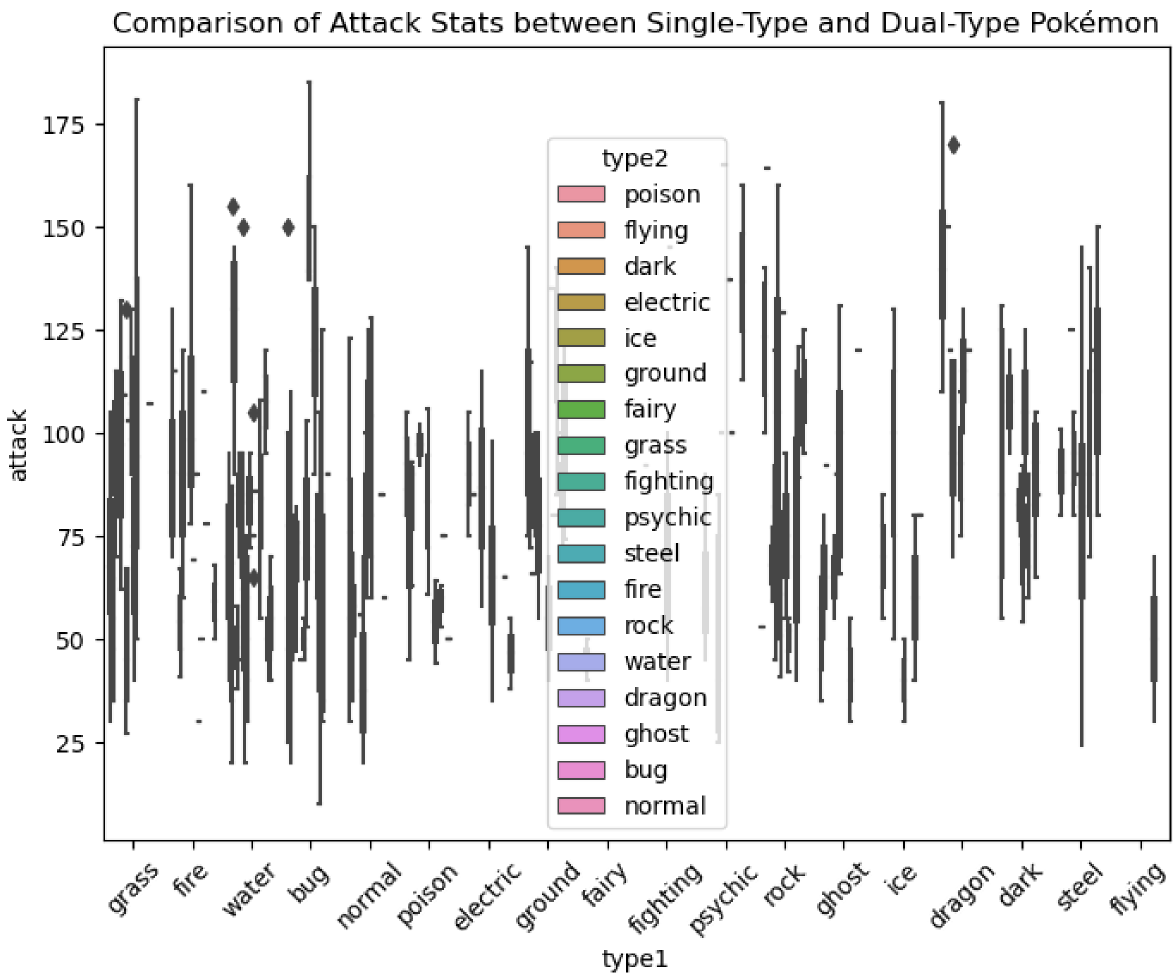
In [45]:

```
# # Pair Plot of type1, attack, defense, and speed
# plt.figure(figsize=(20, 20))
# sns.pairplot(data, hue='type1')
# plt.suptitle('Pair Plot of type1, attack, defense, and speed')
# plt.show()

# # Pair Plot of type2, attack, defense, and speed
# plt.figure(figsize=(20, 20))
# sns.pairplot(data, hue='type2', palette='plasma')
# plt.suptitle('Pair Plot of type2, attack, defense, and speed')
# plt.show()
```

In [46]:

```
# 2. Compare Attack and Defense stats of single-type and dual-type Pokémon
plt.figure(figsize=(8, 6))
sns.boxplot(data=df, x='type1', y='attack', hue='type2')
plt.title("Comparison of Attack Stats between Single-Type and Dual-Type Pokémon")
plt.xticks(rotation=45)
plt.legend(title='type2')
plt.show()
```



In [ ]:

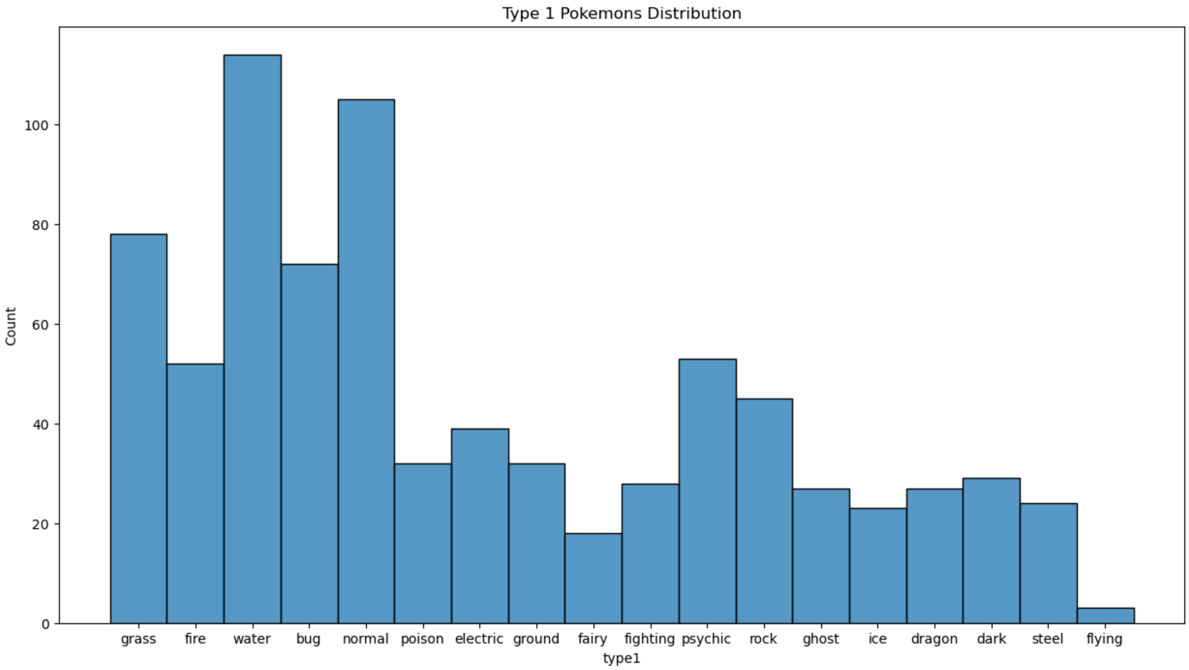
In [ ]:

In [35]:

```
# What are the different primary and secondary type of Pokemon's and how many
of each type is there in the dataset? [Visualize]
plt.figure(figsize=(15,8)) #FOR PRIMARY TYPE i.e TYPE 1
sns.histplot(x='type1',data=df)
plt.title('Type 1 Pokemons Distribution')
```

Out[35]:

```
Text(0.5, 1.0, 'Type 1 Pokemons Distribution')
```

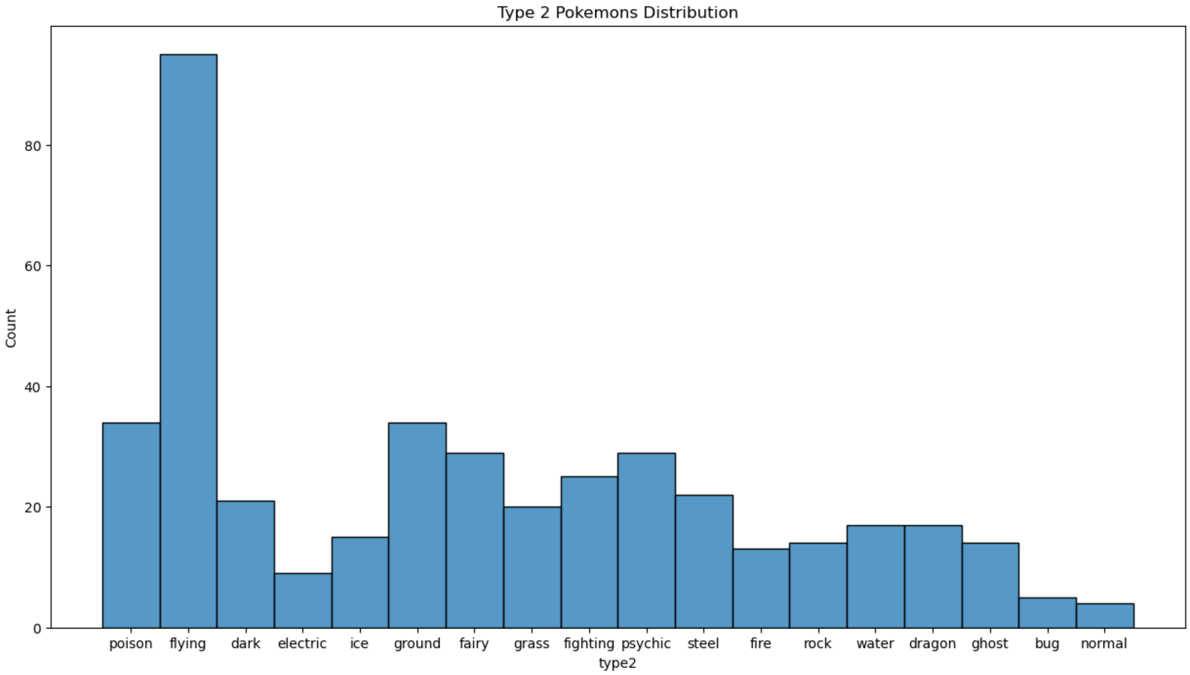


In [37]:

```
plt.figure(figsize=(15,8)) #FOR SECONDARY TYPE i.e TYPE 2
sns.histplot(x='type2',data=df)
plt.title('Type 2 Pokemons Distribution')
```

Out[37]:

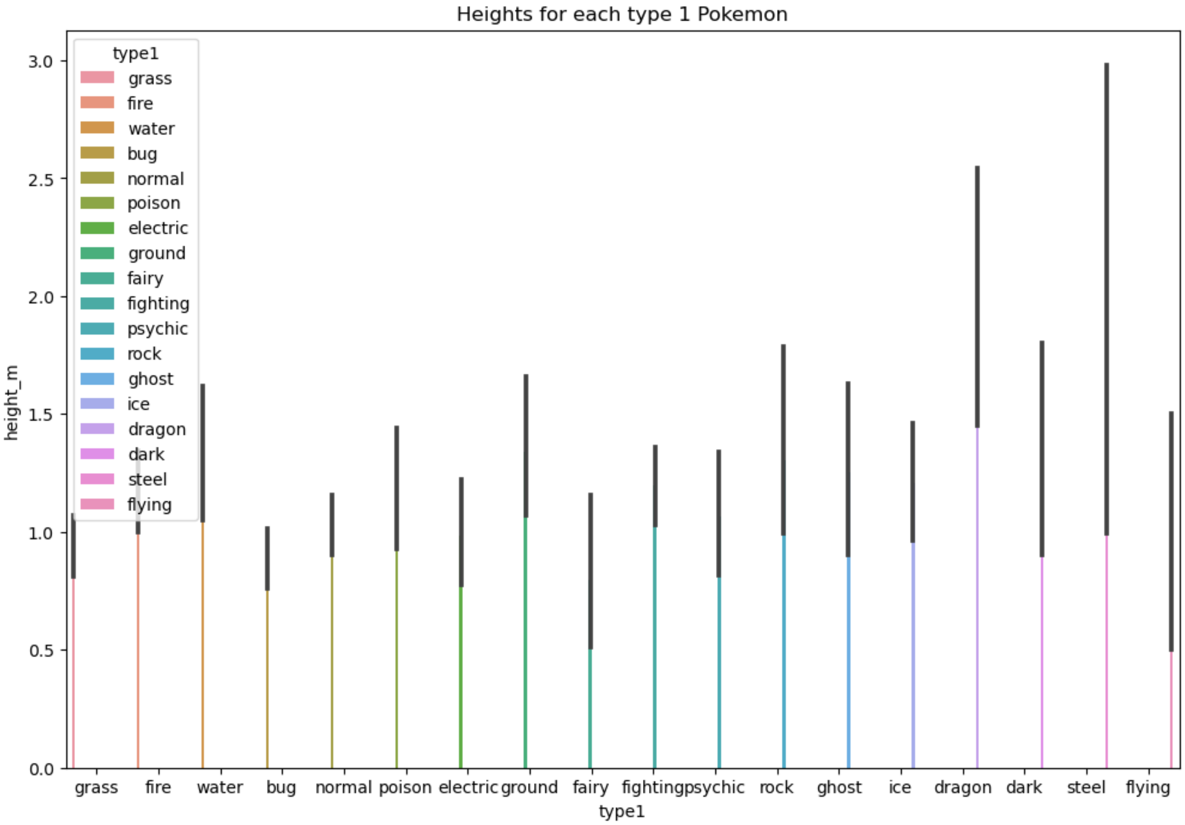
```
Text(0.5, 1.0, 'Type 2 Pokemons Distribution')
```

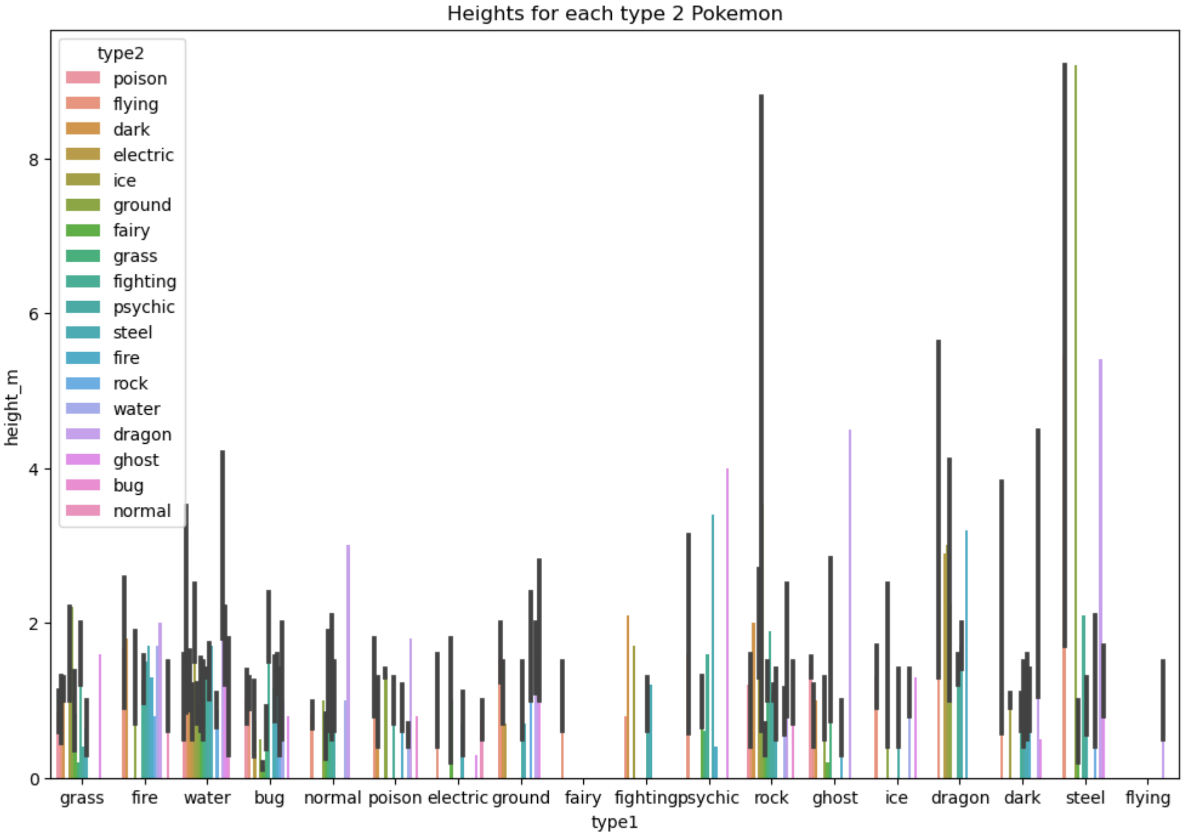


In [44]:

```
# Estimate the central tendency of heights for each type 1 pokemon ?
plt.figure(figsize=(12,8))
sns.barplot(x='type1',y='height_m',data=df,hue='type1')
plt.title('Heights for each type 1 Pokemon')
plt.figure(figsize=(12,8))
sns.barplot(x='type1',y='height_m',data=df,hue='type2')
plt.title('Heights for each type 2 Pokemon')
```

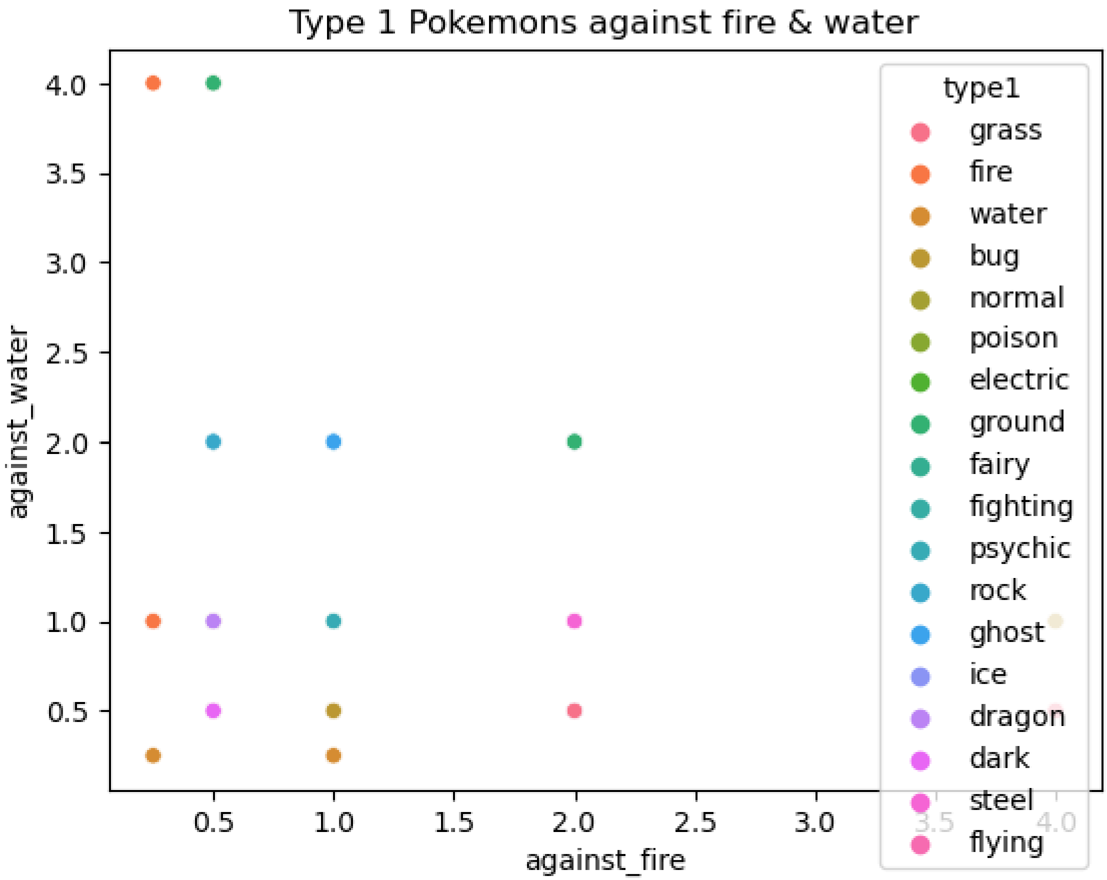
```
Out[44]: Text(0.5, 1.0, 'Heights for each type 2 Pokemon')
```





In [42]:
```
#Compare the different type 1 and type 2 pokemons against fire and water
sns.scatterplot(x='against_fire',y='against_water',data=df,hue='type1') #FOR TYPE1
plt.title('Type 1 Pokemons against fire & water')
```

Out[42]:
```
Text(0.5, 1.0, 'Type 1 Pokemons against fire & water')
```

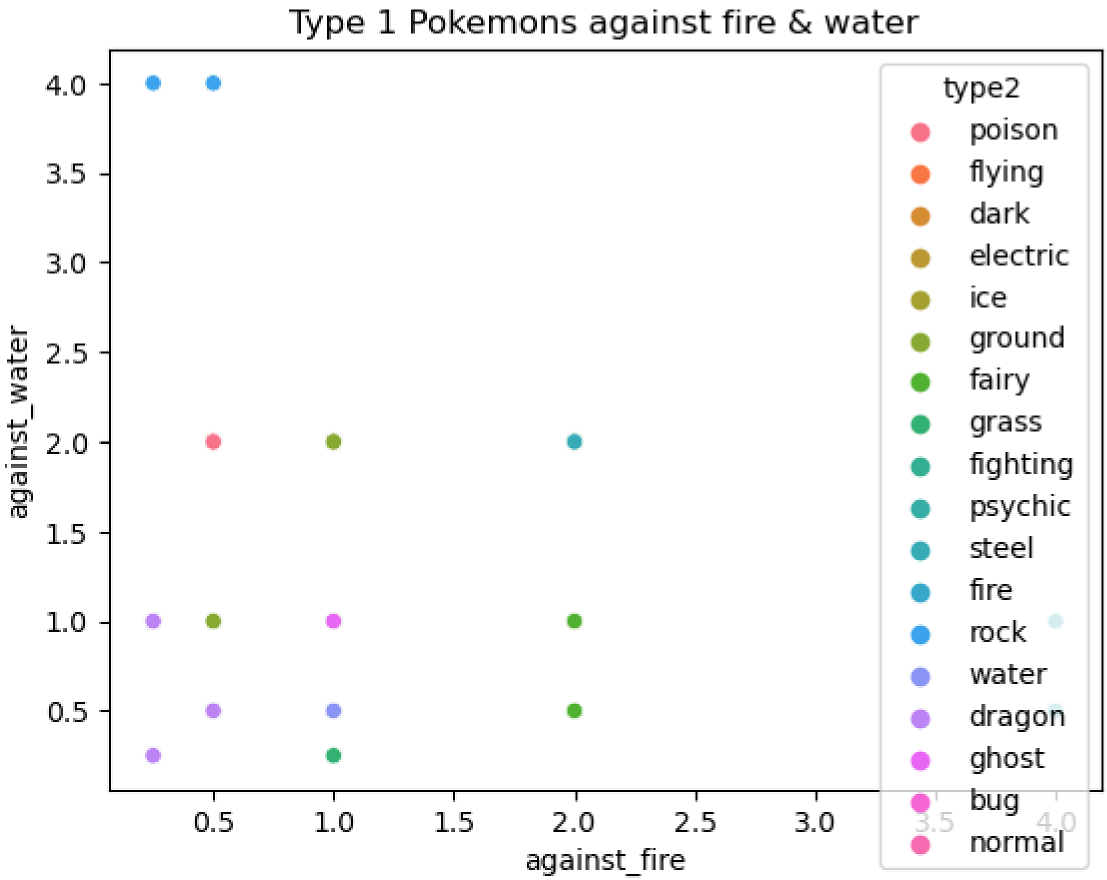


In [43]:

```
#Compare the different type 1 and type 2 pokemons against fire and water
sns.scatterplot(x='against_fire',y='against_water',data=df,hue='type2') #FOR TYPE1
plt.title('Type 1 Pokemons against fire & water')
```

Out[43]:

```
Text(0.5, 1.0, 'Type 1 Pokemons against fire & water')
```



In [ ]:

```
```