In [21]:
```
import numpy as np
import pandas as pd

import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.preprocessing import minmax_scale

import os
from pathlib import Path
import re

import tensorflow as tf
```

In [37]:
```
train_dir = '/content/pokemon/images'
train_path = Path(train_dir)
train_path
```

Out[37]:
```
PosixPath('/content/pokemon/images')
```

In [38]:
```
files = list(train_path.glob('*.png'))
names = [os.path.split(x)[1] for x in list(train_path.glob('*.png'))]

image_df = pd.concat([pd.Series(names, name='Name'), pd.Series(files, name='Filepath').astype(str)], axis=1)
image_df['Name'] = image_df['Name'].apply(lambda x: re.sub(r'\.\w+$', '', x))
image_df
```

Out[38]:

	Name	Filepath
0	buneary	/content/pokemon/images/buneary.png
1	skiddo	/content/pokemon/images/skiddo.png
2	magikarp	/content/pokemon/images/magikarp.png
3	larvitar	/content/pokemon/images/larvitar.png
4	archeops	/content/pokemon/images/archeops.png
...	...	...
716	vulpix	/content/pokemon/images/vulpix.png
717	dragonair	/content/pokemon/images/dragonair.png
718	tauros	/content/pokemon/images/tauros.png
719	silcoon	/content/pokemon/images/silcoon.png
720	exploud	/content/pokemon/images/exploud.png

721 rows × 2 columns

In [39]:
```
pokemon_df = pd.read_csv('/content/pokemon/pokemon.csv')
pokemon_df
```

Out[39]:

	Name	Type1	Type2
0	bulbasaur	Grass	Poison
1	ivysaur	Grass	Poison
2	venusaur	Grass	Poison
3	charmander	Fire	NaN
4	charmeleon	Fire	NaN
...	...	...	...
804	stakataka	Rock	Steel
805	blacephalon	Fire	Ghost
806	zeraora	Electric	NaN
807	meltan	Steel	NaN
808	melmetal	Steel	NaN

809 rows × 3 columns

In [23]:
```
type_colors = [
    "#8ED752", "#F95643", "#53AFFE", "#C3D221", "#BBBDAF",
    "#AD5CA2", "#F8E64E", "#F0CA42", "#F9AEFE", "#A35449",
    "#FB61B4", "#CDBD72", "#7673DA", "#66EBFF", "#8B76FF",
    "#8E6856", "#C3C1D7", "#75A4F9"]
```

In [24]:
```
pokemon_types = pokemon_df['Type1'].unique()
pokemon_colors = dict(zip(pokemon_types, type_colors))
```

In [34]:
```
pokemon_colors
```

Out[34]:
```
{'Bug': '#C3D221',
 'Dark': '#8E6856',
 'Dragon': '#8B76FF',
 'Electric': '#F8E64E',
 'Fairy': '#F9AEFE',
 'Fighting': '#A35449',
 'Fire': '#F95643',
 'Flying': '#75A4F9',
 'Ghost': '#7673DA',
 'Grass': '#8ED752',
 'Ground': '#F0CA42',
 'Ice': '#66EBFF',
 'Normal': '#BBBDAF',
 'Poison': '#AD5CA2',
 'Psychic': '#FB61B4',
 'Rock': '#CDBD72',
 'Steel': '#C3C1D7',
 'Water': '#53AFFE'}
```

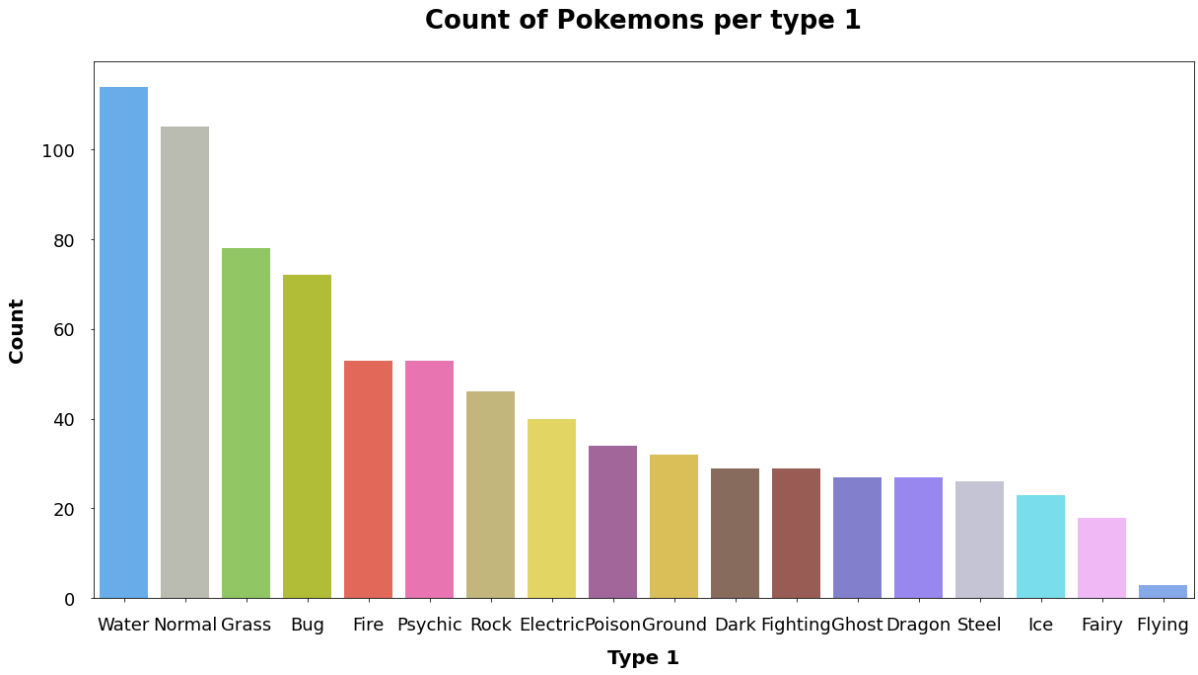
In [32]:
```
pokemon_df['Type1'].value_counts()
```

Out[32]:
```
Water       114
Normal      105
Grass        78
Bug          72
Fire         53
Psychic      53
Rock         46
Electric     40
Poison       34
Ground       32
Dark         29
Fighting     29
Ghost        27
Dragon       27
Steel        26
Ice          23
Fairy        18
Flying        3
Name: Type1, dtype: int64
```

In [25]:
```
df = pokemon_df['Type1'].value_counts()

fig, ax = plt.subplots(1,1,figsize=(20,10))


sns.barplot(df.index, df.values, palette=pokemon_colors, ax=ax)

ax.tick_params(labelsize=18, direction='out', pad=15)
ax.set_xlabel('Type 1', weight='bold', size='20', labelpad=15)
ax.set_ylabel('Count', weight='bold', size='20', labelpad=15)
ax.set_title('Count of Pokemons per type 1',  size='26', weight='bold', y=1.05
)
```

```
/usr/local/lib/python3.7/dist-packages/seaborn/_decorators.py:43: FutureWarni
ng: Pass the following variables as keyword args: x, y. From version 0.12, th
e only valid positional argument will be `data`, and passing other arguments
without an explicit keyword will result in an error or misinterpretation.
  FutureWarning
```

Out[25]:
```
Text(0.5, 1.05, 'Count of Pokemons per type 1')
```



In [41]:
```
# Merging dfs
PokemonFinal_df = image_df.merge(label_df, on='Name')
PokemonFinal_df = PokemonFinal_df.drop(['Name', 'Type2'], axis=1)
PokemonFinal_df
```

Out[41]:

	Filepath	Type1
0	/content/pokemon/images/buneary.png	Normal
1	/content/pokemon/images/skiddo.png	Grass
2	/content/pokemon/images/magikarp.png	Water
3	/content/pokemon/images/larvitar.png	Rock
4	/content/pokemon/images/archeops.png	Rock
...	...	...
716	/content/pokemon/images/vulpix.png	Fire
717	/content/pokemon/images/dragonair.png	Dragon
718	/content/pokemon/images/tauros.png	Normal
719	/content/pokemon/images/silcoon.png	Bug
720	/content/pokemon/images/exploud.png	Normal

721 rows × 2 columns

In [43]:
```
PokemonFinal_df.shape
```

Out[43]:
```
(721, 2)
```

In [44]:
```
# Limiting data to Fire and Water types
wfpoke_df = train_df.query("Type1 == 'Fire' | Type1 == 'Water'")
wfpoke_df
```

Out[44]:

	Filepath	Type1
2	/content/pokemon/images/magikarp.png	Water
7	/content/pokemon/images/pansear.png	Fire
9	/content/pokemon/images/slugma.png	Fire
11	/content/pokemon/images/squirtle.png	Water
12	/content/pokemon/images/poliwrath.png	Water
...	...	...
687	/content/pokemon/images/tentacool.png	Water
701	/content/pokemon/images/wailmer.png	Water
702	/content/pokemon/images/poliwhirl.png	Water
704	/content/pokemon/images/palkia.png	Water
716	/content/pokemon/images/vulpix.png	Fire

152 rows × 2 columns

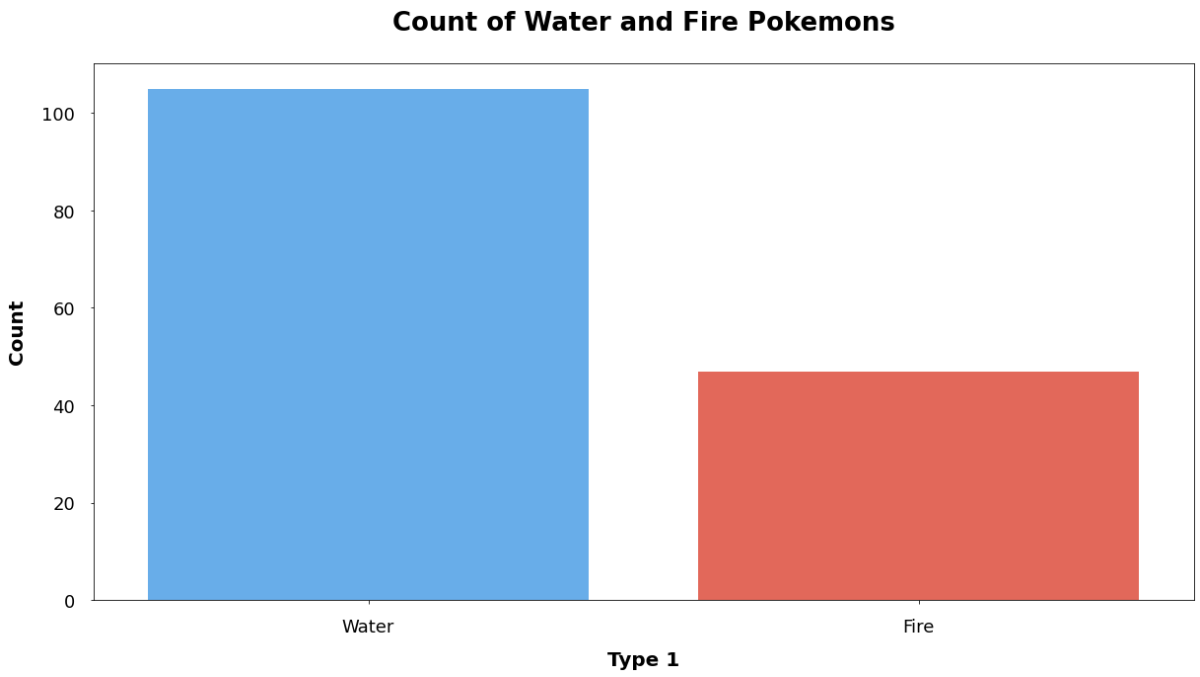
In [45]:
```
wfpoke_df['Type1'].value_counts()
```

Out[45]:
```
Water    105
Fire      47
Name: Type1, dtype: int64
```

In [35]:
```
df = wfpoke_df['Type1'].value_counts()

fig, ax = plt.subplots(1,1,figsize=(20,10))


sns.barplot(df.index, df.values, palette=pokemon_colors, ax=ax)

ax.tick_params(labelsize=18, direction='out', pad=15)
ax.set_xlabel('Type 1', weight='bold', size='20', labelpad=15)
ax.set_ylabel('Count', weight='bold', size='20', labelpad=15)
ax.set_title('Count of Water and Fire Pokemons',  size='26', weight='bold', y=
1.05)
```

```
/usr/local/lib/python3.7/dist-packages/seaborn/_decorators.py:43: FutureWarni
ng: Pass the following variables as keyword args: x, y. From version 0.12, th
e only valid positional argument will be `data`, and passing other arguments
without an explicit keyword will result in an error or misinterpretation.
  FutureWarning
```

Out[35]:
```
Text(0.5, 1.05, 'Count of Water and Fire Pokemons')
```



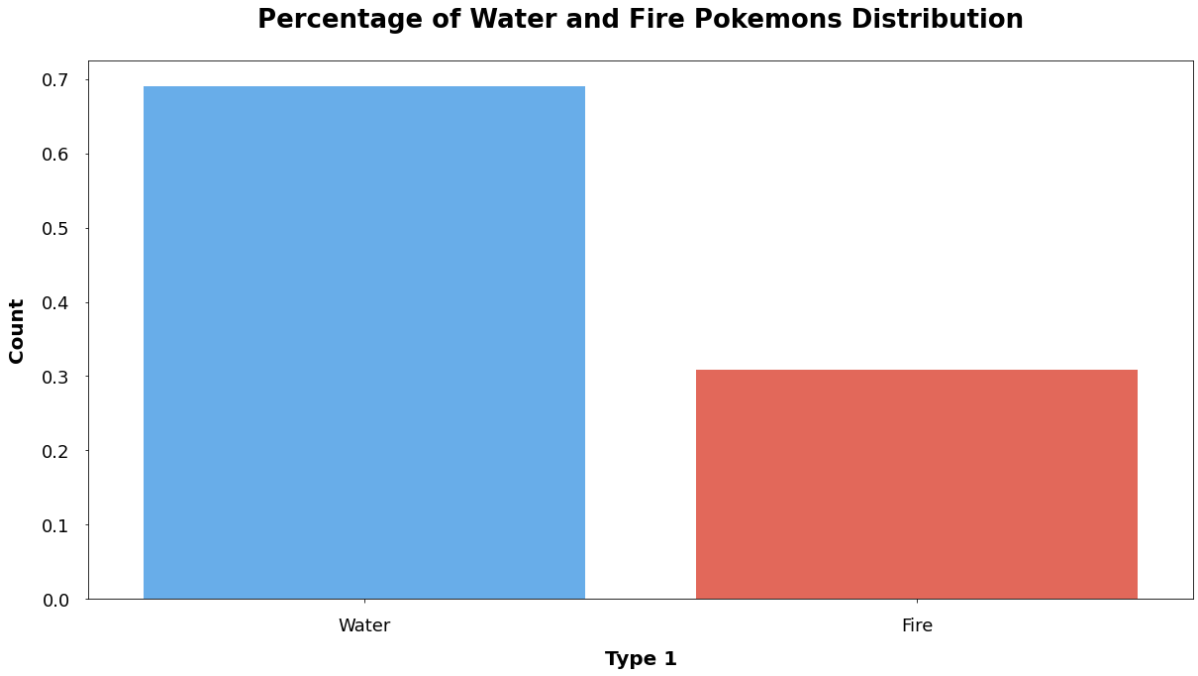
In [49]:
```
wfpoke_df.Type1.value_counts(normalize=True)
```

Out[49]:
```
Water    0.690789
Fire     0.309211
Name: Type1, dtype: float64
```

In [51]:
```
df = wfpoke_df.Type1.value_counts(normalize=True)
fig, ax = plt.subplots(1,1,figsize=(20,10))

sns.barplot(df.index, df.values, palette=pokemon_colors, ax=ax)

ax.tick_params(labelsize=18, direction='out', pad=15)
ax.set_xlabel('Type 1', weight='bold', size='20', labelpad=15)
ax.set_ylabel('Count', weight='bold', size='20', labelpad=15)
ax.set_title('Percentage of Water and Fire Pokemons Distribution',  size='26',
weight='bold', y=1.05)
```

```
/usr/local/lib/python3.7/dist-packages/seaborn/_decorators.py:43: FutureWarni
ng: Pass the following variables as keyword args: x, y. From version 0.12, th
e only valid positional argument will be `data`, and passing other arguments
without an explicit keyword will result in an error or misinterpretation.
  FutureWarning
```

Out[51]:
```
Text(0.5, 1.05, 'Percentage of Water and Fire Pokemons Distribution')
```



In [ ]:

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