# EMPLOYEE SALARIES FOR DIFFERENT JOB ROLES

In [18]:
```
import pandas as pd
```

In [19]:
```
data = pd.read_csv('D:\Data Science Project\Employee Salaries for Different Job Roles/ds_salaries.cs
```

In [20]:
```
data.head()
```

Out[20]:

| | Unnamed: 0 | work_year | experience_level | employment_type | job_title | salary | salary_currency | salary_in_usd | employee_re |
|---|---|---|---|---|---|---|---|---|---|
| **0** | 0 | 2020 | MI | FT | Data Scientist | 70000 | EUR | 79833 | |
| **1** | 1 | 2020 | SE | FT | Machine Learning Scientist | 260000 | USD | 260000 | |
| **2** | 2 | 2020 | SE | FT | Big Data Engineer | 85000 | GBP | 109024 | |
| **3** | 3 | 2020 | MI | FT | Product Data Analyst | 20000 | USD | 20000 | |
| **4** | 4 | 2020 | SE | FT | Machine Learning Engineer | 150000 | USD | 150000 | |

In [21]:
```
data.tail(5)
```

Out[21]:

| | Unnamed: 0 | work_year | experience_level | employment_type | job_title | salary | salary_currency | salary_in_usd | employee_ |
|---|---|---|---|---|---|---|---|---|---|
| **602** | 602 | 2022 | SE | FT | Data Engineer | 154000 | USD | 154000 | |
| **603** | 603 | 2022 | SE | FT | Data Engineer | 126000 | USD | 126000 | |
| **604** | 604 | 2022 | SE | FT | Data Analyst | 129000 | USD | 129000 | |
| **605** | 605 | 2022 | SE | FT | Data Analyst | 150000 | USD | 150000 | |
| **606** | 606 | 2022 | MI | FT | AI Scientist | 200000 | USD | 200000 | |

In [22]:
```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 607 entries, 0 to 606
Data columns (total 12 columns):
 #   Column              Non-Null Count  Dtype 
---  ------              --------------  ----- 
 0   Unnamed: 0          607 non-null    int64 
 1   work_year           607 non-null    int64 
 2   experience_level    607 non-null    object
 3   employment_type     607 non-null    object
 4   job_title           607 non-null    object
 5   salary              607 non-null    int64 
 6   salary_currency     607 non-null    object
 7   salary_in_usd       607 non-null    int64 
 8   employee_residence  607 non-null    object
 9   remote_ratio        607 non-null    int64 
 10  company_location    607 non-null    object
 11  company_size        607 non-null    object
dtypes: int64(5), object(7)
memory usage: 57.0+ KB
```

In [23]:
```
data.describe()
```

Out[23]:

| | Unnamed: 0 | work_year | salary | salary_in_usd | remote_ratio |
|---|---|---|---|---|---|
| count | 607.000000 | 607.000000 | 6.070000e+02 | 607.000000 | 607.00000 |
| mean | 303.000000 | 2021.405272 | 3.240001e+05 | 112297.869852 | 70.92257 |
| std | 175.370085 | 0.692133 | 1.544357e+06 | 70957.259411 | 40.70913 |
| min | 0.000000 | 2020.000000 | 4.000000e+03 | 2859.000000 | 0.00000 |
| 25% | 151.500000 | 2021.000000 | 7.000000e+04 | 62726.000000 | 50.00000 |
| 50% | 303.000000 | 2022.000000 | 1.150000e+05 | 101570.000000 | 100.00000 |
| 75% | 454.500000 | 2022.000000 | 1.650000e+05 | 150000.000000 | 100.00000 |
| max | 606.000000 | 2022.000000 | 3.040000e+07 | 600000.000000 | 100.00000 |

# DATA PREPROCESSING

In [25]:
```
print("    Size of the Table ")
print("Number of Rows:",data.shape[0])
print("Number of Columns:",data.shape[1])
```

```
    Size of the Table
Number of Rows: 607
Number of Columns: 12
```

In [26]:
```
data = data.rename(columns={'Unnamed: 0':'S.No.'})
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 607 entries, 0 to 606
Data columns (total 12 columns):
 #   Column              Non-Null Count  Dtype 
---  ------              --------------  ----- 
 0   S.No.               607 non-null    int64 
 1   work_year           607 non-null    int64 
 2   experience_level    607 non-null    object
 3   employment_type     607 non-null    object
 4   job_title           607 non-null    object
 5   salary              607 non-null    int64 
 6   salary_currency     607 non-null    object
 7   salary_in_usd       607 non-null    int64 
 8   employee_residence  607 non-null    object
 9   remote_ratio        607 non-null    int64 
 10  company_location    607 non-null    object
 11  company_size        607 non-null    object
dtypes: int64(5), object(7)
memory usage: 57.0+ KB
```

In [33]:
```
data.isnull().sum()
```

Out[33]:
```
S.No.                 0
work_year             0
experience_level      0
employment_type       0
job_title             0
salary                0
salary_currency       0
salary_in_usd         0
employee_residence    0
remote_ratio          0
company_location      0
company_size          0
dtype: int64
```

In [35]:
```
employment_type = data.groupby('employment_type').size()
employment_type
```

Out[35]:
```
employment_type
CT      5
FL      4
FT    588
PT     10
dtype: int64
```

In [47]:
```
data['employment_type'] = data['employment_type'].replace({'CT':'Contract','FL':'Freelance','PT':'Pa
employment_type_updated = data.groupby('employment_type').size()
employment_type_updated
```

Out[47]:
```
employment_type
Contract       5
Freelance      4
Full Time    588
Part Time     10
dtype: int64
```

In [38]:
```
experience_level = data.groupby('experience_level').size()
experience_level
```

Out[38]:
```
experience_level
EN     88
EX     26
MI    213
SE    280
dtype: int64
```

In [39]:
```
# EN - Entry Level
# EX - Experienced
# MI - Mid Level
# SE - Senior Level
```

In [46]:
```
data['experience_level'] = data['experience_level'].replace({'EN':'Entry Level','EX':'Experienced',
                                                              'MI':'Mid Level','SE':'Senior Level'})
experience_level_updated = data.groupby('experience_level').size()
experience_level_updated
```

Out[46]:
```
experience_level
Entry Level      88
Experienced      26
Mid Level       213
Senior Level    280
dtype: int64
```

In [43]:
```
company_size = data.groupby('company_size').size()
company_size
```

Out[43]:
```
company_size
L    198
M    326
S     83
dtype: int64
```

In [45]:
```
data['company_size'] = data['company_size'].replace({'L':'Large','S':'Small','M':'Medium'})
company_size_updated = data.groupby('company_size').size()
company_size_updated
```

Out[45]:
```
company_size
Large     198
Medium    326
Small      83
dtype: int64
```

In [48]:
```
# Dropping unwanted columns
data=data.drop(columns=['salary_in_usd','employee_residence'])
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 607 entries, 0 to 606
Data columns (total 10 columns):
 #   Column            Non-Null Count  Dtype 
---  ------            --------------  ----- 
 0   S.No.             607 non-null    int64 
 1   work_year         607 non-null    int64 
 2   experience_level  607 non-null    object
 3   employment_type   607 non-null    object
 4   job_title         607 non-null    object
 5   salary            607 non-null    int64 
 6   salary_currency   607 non-null    object
 7   remote_ratio      607 non-null    int64 
 8   company_location  607 non-null    object
 9   company_size      607 non-null    object
dtypes: int64(4), object(6)
memory usage: 47.6+ KB
```

In [49]:
```
data.head()
```

Out[49]:

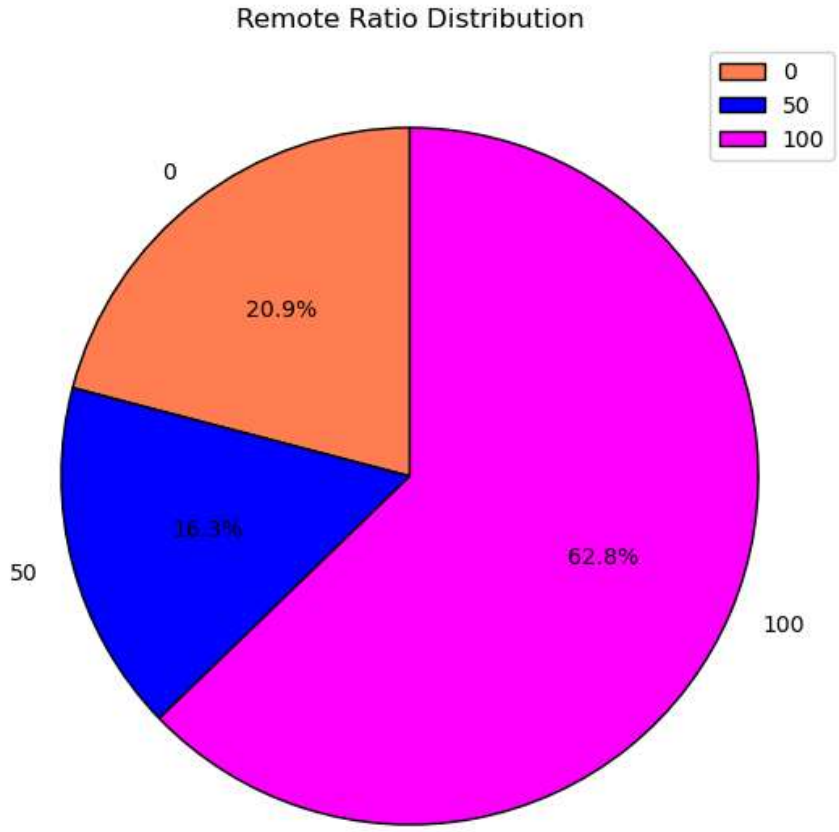
| | S.No. | work_year | experience_level | employment_type | job_title | salary | salary_currency | remote_ratio | company_location |
|---|---|---|---|---|---|---|---|---|---|
| **0** | 0 | 2020 | Mid Level | Full Time | Data Scientist | 70000 | EUR | 0 | DE |
| **1** | 1 | 2020 | Senior Level | Full Time | Machine Learning Scientist | 260000 | USD | 0 | JP |
| **2** | 2 | 2020 | Senior Level | Full Time | Big Data Engineer | 85000 | GBP | 50 | GB |
| **3** | 3 | 2020 | Mid Level | Full Time | Product Data Analyst | 20000 | USD | 0 | HN |
| **4** | 4 | 2020 | Senior Level | Full Time | Machine Learning Engineer | 150000 | USD | 50 | US |

In [51]:
```
data.to_csv('Employee Salary.csv',index=False)
```

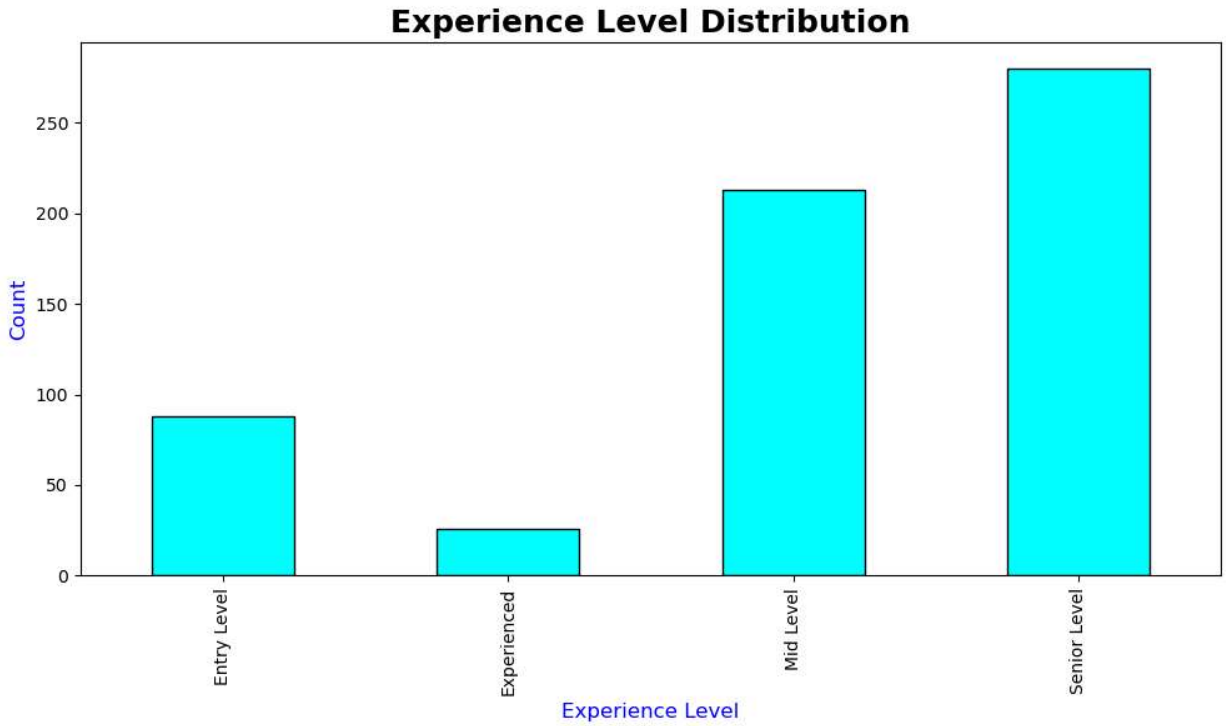
# DATA VISUALIZATION AND EDA

In [55]:
```
# Salary Distribution

import matplotlib.pyplot as plt
plt.figure(figsize=(10,4))
data['salary'].plot.hist(bins=30,color='skyblue',edgecolor='black')
plt.title('Salary Distribution',fontsize=18)
plt.xlabel('Salary',fontsize=12)
plt.ylabel('Frequency',fontsize=12)
plt.tight_layout()
plt.grid(True)
plt.show()
```


In [63]:
```
# Remote Ratio
remote_ratio = data.groupby('remote_ratio').size()

plt.figure(figsize=(7,7))
plt.pie(remote_ratio,autopct='%1.1f%%',startangle=90,labels=remote_ratio.index,
        colors=['coral','blue','magenta'],wedgeprops={'edgecolor':'black'})
plt.title('Remote Ratio Distribution')
plt.legend()
plt.show()
```

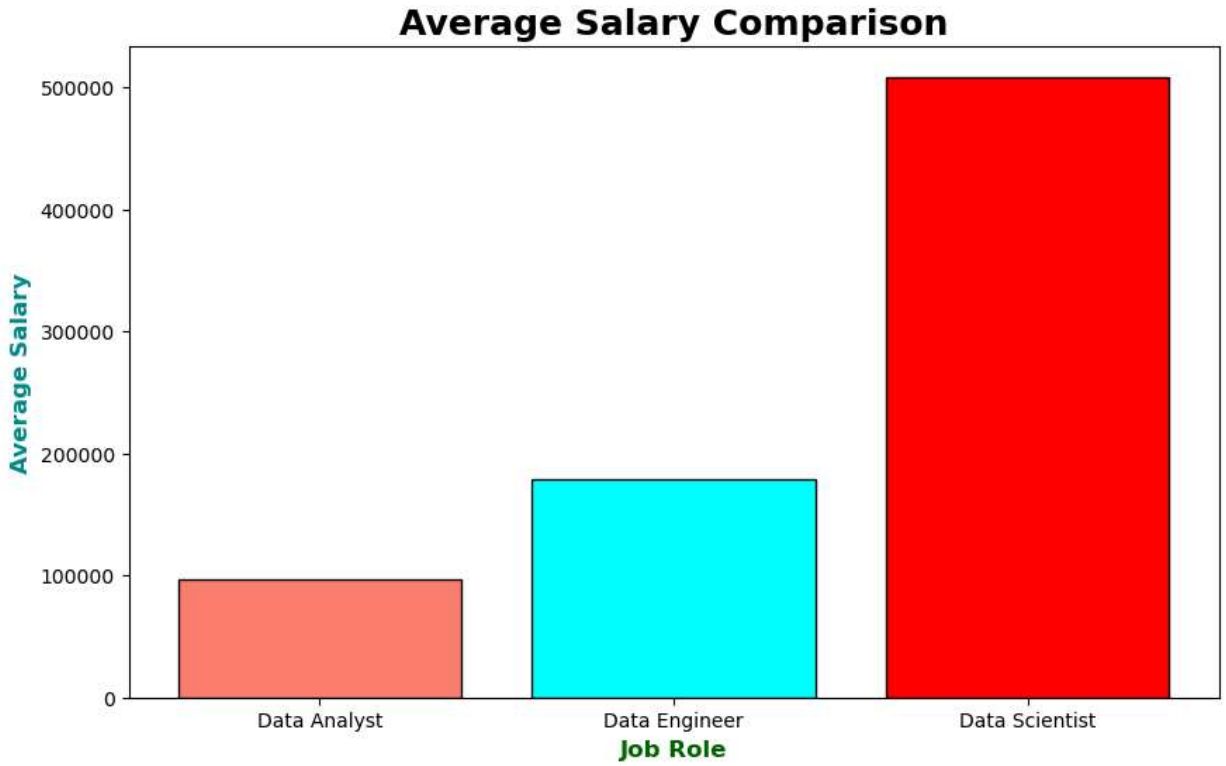


In [69]:
```
# Experience Level Distribution
experience_level = data.groupby('experience_level').size()
plt.figure(figsize=(10,6))
experience_level.plot.bar(color='cyan',edgecolor='black')
plt.title('Experience Level Distribution',fontsize=18,fontweight='bold')
plt.xlabel('Experience Level',fontsize=12,color='blue')
plt.ylabel('Count',fontsize=12,color='blue')
plt.tight_layout()
plt.show()
```

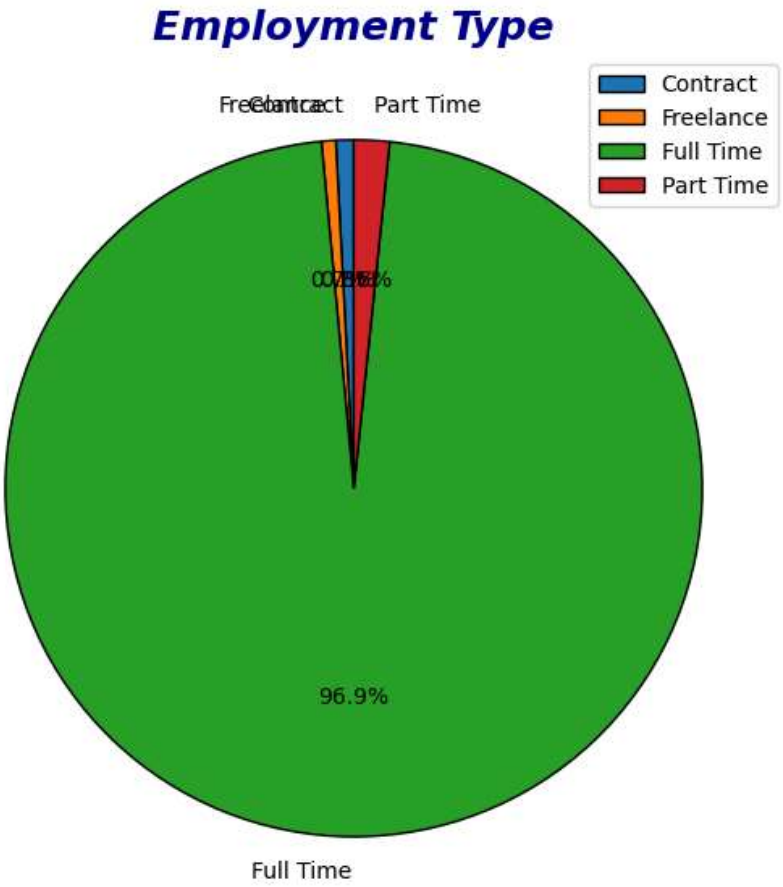


In [70]:
```
# Salary vs Experience Level

import seaborn as sns

plt.figure(figsize=(10,6))
sns.boxplot(x='experience_level',y='salary',data=data)
plt.title('Salary vs Experience Level',fontsize=18,fontweight='bold')
plt.xlabel('Experience Level',fontsize=12,fontweight='bold',color='darkred')
plt.ylabel('Salary',fontsize=12,fontweight='bold',color='darkblue')
plt.tight_layout()
plt.grid(True)
plt.show()
```

In [75]:
```
# Find average salary of the Job Role

job_role = ['Data Analyst','Data Engineer','Data Scientist']

avg_salary = [data[data['job_title'] == title]['salary'].mean() for title in job_role]
plt.figure(figsize=(10,6))
plt.bar(job_role,avg_salary,color=['salmon','cyan','red'],edgecolor='black')
plt.title('Average Salary Comparison',fontsize=18,fontweight='bold')
plt.xlabel('Job Role',fontsize=12,fontweight='bold',color='darkgreen')
plt.ylabel('Average Salary',fontsize=12,fontweight='bold',color='darkcyan')
plt.show()
```



In [83]:
```
# Employment Type

emp_type = data.groupby('employment_type').size()
plt.figure(figsize=(7,7))
plt.pie(emp_type,autopct='%1.1f%%',wedgeprops={'edgecolor':'black'},startangle=90,labels=emp_type.in
plt.title("Employment Type",fontsize=18,fontweight='bold',fontstyle='italic',color='darkblue')
plt.legend()
plt.show()
```




In [ ]: