Project introduction

The project aims to use data science tools including Pandas and Polars, to perform descriptive statistics on the job applicant data, to gain insights into the demographics of job applicants.

In [1]:
```
from mylib.lib import (
    load_dataset,
    total_applicants,
    total_female_applicant,
    total_male_applicant,
    total_unknown_applicant,
    gender_total,
    gender_chart,
    ethnicity_total,
    ethnicity_chart,
)
```

In [2]:
```
csv = "Job_Applicants.csv"
df = load_dataset(csv)
assert df is not None
assert df.shape == (187, 14)
print(df.head)
```

```
<bound method NDFrame.head of     Fiscal Year                Job Number  \
0     2013-2014         9206 OP 2014/04/18
1     2013-2014          1223 P 2013/08/09
2     2013-2014         7260 OP 2014/02/14
3     2013-2014          3227 P 2013/11/15
4     2013-2014          2400 O 2014/05/02
..          ...                        ...
182   2014-2015   7840 P 2014/7/25-ARCHIVE
183   2014-2015  4123 O 2014/07/04-ARCHIVE
184   2014-2015   7857 O 2014/7/18-ARCHIVE
185   2014-2015  3912/P/2014/07/25-ARCHIVE
186   2014-2015  1774 OP 2014/7/18-ARCHIVE

                                    Job Description  Apps Received  Femal
e  \
0                                  311 DIRECTOR 9206             54      2
0
1                                ACCOUNTING CLERK 1223            648     48
8
2                                 AIRPORT MANAGER 7260             51      1
3
3                         AIRPORT POLICE LIEUTENANT 2013             48
```

```
9
4                                        AQUARIST 2400             40      1
5
..                                                 ...            ...
...
182  WASTEWATER TREATMENT LABORATORY MANAGER 7840 -...             16
6
183       WASTEWATER TREATMENT OPERATOR 4123 - ARCHIVE            125
9
184                WATER MICROBIOLOGIST 7857 - ARCHIVE            179      8
9
185                WATER UTILITY WORKER 3912 - ARCHIVE             96
2
186       WORKERS' COMPENSATION ANALYST 1774 - ARCHIVE            166     10
0

     Male  Unknown_Gender  Black  Hispanic  Asian  Caucasian  \
0      31               3     25        18      1          6
1     152               8    151       204    123         62
2      37               1      8        12      9         20
3      38               1     21        14      3          7
4      24               1      3         7      7         19
..    ...             ...    ...       ...    ...        ...
182     9               1      3         0      5          7
183   113               3     29        38     10         32
184    82               8     13        37     64         25
185    92               2      8        48      6         23
186    61               5     44        61     14         21

     American Indian/ Alaskan Native  Filipino  Unknown_Ethnicity
0                                  0         0                  4
1                                  3        79                 26
2                                  0         0                  2
3                                  0         1                  2
4                                  1         1                  2
..                               ...       ...                ...
182                                0         0                  1
183                                7         4                  5
184                                0        18                 22
185                                1         7                  3
186                                0        11                 15

[187 rows x 14 columns]>
```

In [3]:
```python
def stats_overview(df):
    summary_stats = df[["Apps Received", "Female", "Male", "Unknown_Gender"]
    summary_stats.loc["total"] = df[
        ["Apps Received", "Female", "Male", "Unknown_Gender"]
    ].sum()
    summary_stats = summary_stats.round(2)
```

```
    return summary_stats


stats_overview(df)
```

Out[3]:

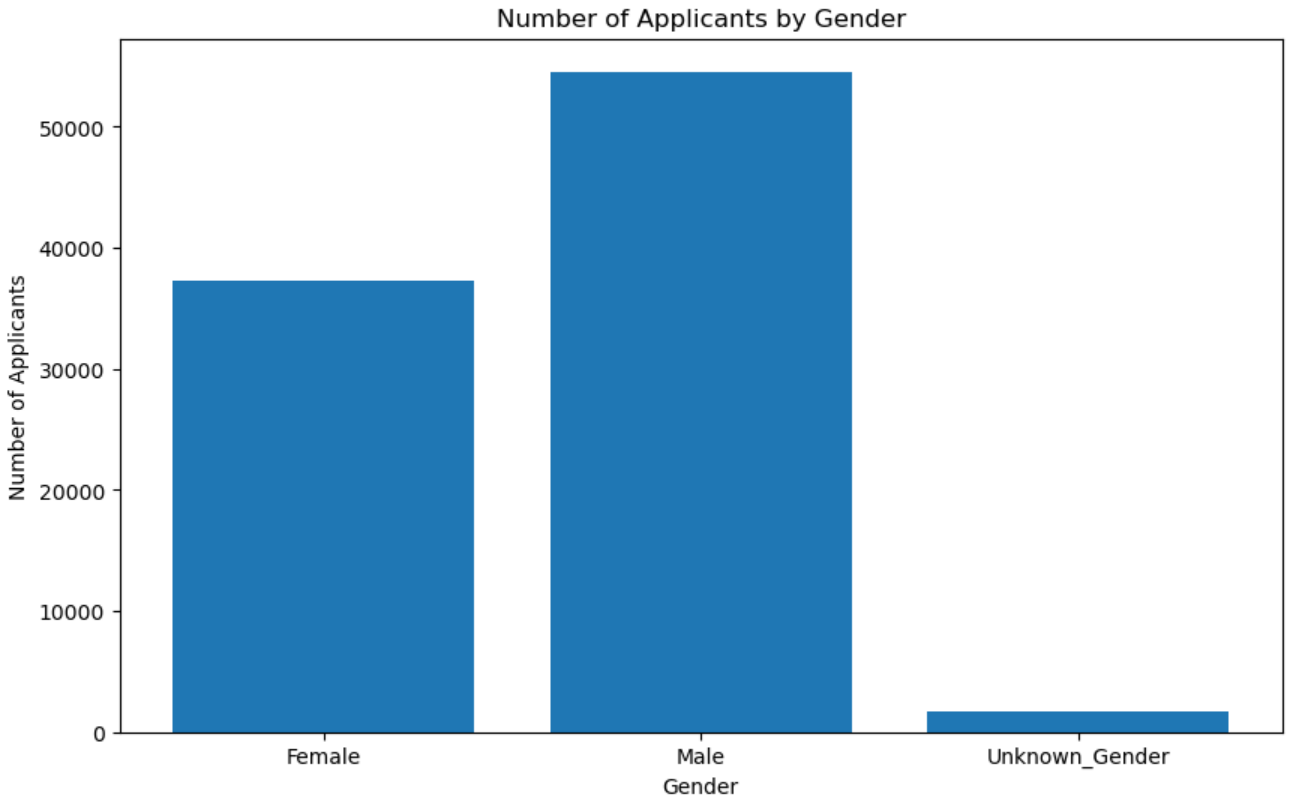
	Apps Received	Female	Male	Unknown_Gender
count	187.00	187.00	187.00	187.00
mean	499.72	199.03	291.71	8.98
std	2252.04	1466.00	991.02	36.56
min	5.00	0.00	2.00	0.00
25%	36.50	2.00	26.00	0.00
50%	100.00	13.00	70.00	2.00
75%	260.00	59.50	166.00	6.00
max	28230.00	19892.00	9356.00	370.00
total	93448.00	37219.00	54549.00	1680.00

In [4]:
```
def number_of_applicants(df):
    total_apps = total_applicants(df)
    total_female = total_female_applicant(df)
    total_male = total_male_applicant(df)
    total_unknown = total_unknown_applicant(df)
    return total_apps, total_female, total_male, total_unknown


print(number_of_applicants(df))
```

```
Total applicants: 93,448
Total female applicants: 37,219
Total male applicants: 54,549
Total unknown gender applicants: 1,680
(np.int64(93448), np.int64(37219), np.int64(54549), np.int64(1680))
```

Gender Analysis

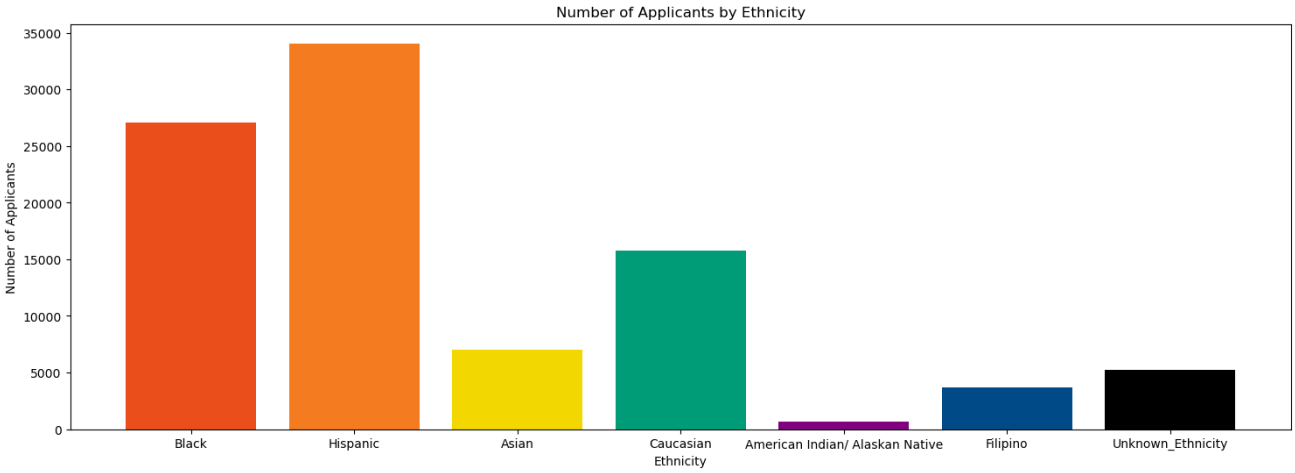
In [5]:
```
def gender_visulization(df):
    total_gender = gender_total(df)
    gender_chart(total_gender)


gender_visulization(df)
```



- Male applicants significantly outnumber female applicants;
- There is a small number of applicants with unknown gender.

Ethnicity Analysis

In [6]:
```
def ethi_visulization(df):
    total_ethi = ethnicity_total(df)
    ethnicity_chart(total_ethi)


ethi_visulization(df)
```



- Hispanic applicants form the largest group with 34,065 applicants
- Black applicants are the second largest group with 27,027 applicants
- Caucasian ethnicity is the third largest group with around 15,796 applicants
- Asian, Filipino, American Indian/Alaskan Native, and Unknown Ethnicity categories have significantly fewer applicants