```python
import math

#Part 1: Basic Python Syntax
print("Part 1: Basic Python Syntax")
print("\n")
# 1.Create a variable, var, and set the value to the string "Hello, world!".

Var = "Hello, world"
print("1.Create a variable, var, and set the value to the string "Hello, worl
print(Var)
print("\n")

#2.Now print the length of var.
print("2.Now print the length of var.")
print(len(Var))
print("\n")

#3.Extract "world" from var using string index slicing.
print("3.Extract "world" from var using string index slicing.")
print(Var[7:12:1])
print("\n")

#4. Print the types for 1, 1.0, and "1" and note how they differ.
print("4. Print the types for 1, 1.0, and "1" and note how they differ.")
print(type(1))
print(type(1.0))
print(type("1"))
print("\n")

#5.Calculate and print the area of a circle of radius 5 to two decimal places
print("5.Calculate and print the area of a circle of radius 5 to two decimal
Radius = 5
Area = math.pi * (Radius**2)
print(round(Area,2))
print("\n")

#6.Write a for loop that prints the numbers 0 to 9.
print("6.Write a for loop that prints the numbers 0 to 9.")
for x in range (0,10) :
    print(x)
print("\n")

#7.Write a for loop that prints only even numbers from 10 to 20.
print("7.Write a for loop that prints only even numbers from 10 to 20.")
for x in range (10,21) :
    if x%2 == 0: print(x)
print("\n")

#8.Write an if/else statement that takes a variable var and prints
#"Greater than 10" if var is greater than 10,
#"Less than 10" if var is less than 10,
#"Equal to 10" if var is equal to 10.
print("8.Write an if/else statement that takes a variable var and prints")
print(""Greater than 10" if var is greater than 10,")
print(""Less than 10" if var is less than 10,")
print(""Equal to 10" if var is equal to 10,")
```

```
var = int (input ("Enter your number:"))
if var > 10: print("Greater than 10")
elif var < 10: print("Less than 10")
elif var == 10: print("Equal to 10")
print("\n")

#9.Write a function which takes a string as its parameter and returns the len
print("9.Write a function which takes a string as its parameter and returns t
string = input("Enter a string: ")
print(len(string))
print("\n")

#10.Write a function which takes a positive integer n as its parameter, and p
print("10.Write a function which takes a positive integer n as its parameter,
n= int(input("Enter a positive integer: "))
for x in range (1,n+1) :
    if x%2 != 0: print(x)
print("\n")
```

Part 1: Basic Python Syntax

1.Create a variable, var, and set the value to the string "Hello, worl
d!".
Hello, world

2.Now print the length of var.
12

3.Extract "world" from var using string index slicing.
world

4. Print the types for 1, 1.0, and "1" and note how they differ.
<class 'int'>
<class 'float'>
<class 'str'>

5.Calculate and print the area of a circle of radius 5 to two decimal pla
ces.
78.54

6.Write a for loop that prints the numbers 0 to 9.
0
1
2
3
4
5
6
7
8
9

7.Write a for loop that prints only even numbers from 10 to 20.
10
12
14
16
18
20

8.Write an if/else statement that takes a variable var and prints
"Greater than 10" if var is greater than 10,
"Less than 10" if var is less than 10,
"Equal to 10" if var is equal to 10,
Enter your number:35
Greater than 10

9.Write a function which takes a string as its parameter and returns the
length of the string.
Enter a string: Hey, How are you today?
23

10.Write a function which takes a positive integer n as its parameter, an
d prints out all odd numbers from 1 to n.
Enter a positive integer: 8
1
3
5
7

```python
print("Part 2: Simple Charts")
print("\n")
print("Pie Chart: ")
print("Make a pie chart that shows the distribution of animals in a zoo that

import numpy as np
import matplotlib.pyplot as plt

%matplotlib inline

# Pie chart, 30 penguins, 40 polar bears, 20 lions, and 10 otters.

animals = ['Penguins', 'Polar Bears', 'Lions', 'Otters']

numbers = [30, 40, 20, 10]

color = ['r','y','b','m']

plt.pie(numbers, labels=animals, colors= color, autopct = '%1.1f%%')
plt.axis('equal')

plt.title("Number of animals in the zoo")

plt.legend()

plt.show()

print("\n")

print("Bar Chart: ")
print("Make a bar chart that shows the number of people, out of a total of 40

# Bar chart, total = 40, 10 people like comedy; 8 people like action; 15 peop

Genre = ['Comedy', 'Action', 'Romance', 'Drama','Sci-Fi']

people = [10, 8, 15, 2, 5]


plt.bar(Genre, people)
plt.title('Movie Genre Vs Number of people')
plt.xlabel('Movie Genre')
plt.ylabel('Number of people')
plt.show()

print("\n")

print("Grouped Bar Plots:")
print("Make both a side-by-side bar plot and a stacked bar plot that displays

child = [680, 950, 2056, 4502]
adult = [215, 400, 1100, 1800]
month = ['April', 'May', 'June', 'July']

X = np.arange(len(month))
```

```
plt.bar(X - 0.2, child, 0.4, label = 'Children')
plt.bar(X + 0.2, adult, 0.4, label = 'Adults')

plt.xticks(X, month)
plt.xlabel("Months")
plt.ylabel("Number of visitors")
plt.title("Side-by-side Bar Chart: Number of child and adult visitors at a wa


plt.legend()

plt.show()

plt.bar(X , child,  label = 'Children')
plt.bar(X , adult, label = 'Adults')

plt.xticks(X, month)
plt.xlabel("Months")
plt.ylabel("Number of visitors")
plt.title("Stacked Bar Chart: Number of child and adult visitors at a waterpa


plt.legend()

plt.show()

print("\n")

print("Histogram:")
print("Make a histogram of the following scores. Feel free to experiment on t

a = [114.8, 98.8, 97.3, 96, 94.1, 93.1, 93.1, 91.6, 91.5, 91.3, 90.3, 89.2, 8

plt.style.use('ggplot')
plt.hist(a, bins = 100)


plt.show()
```
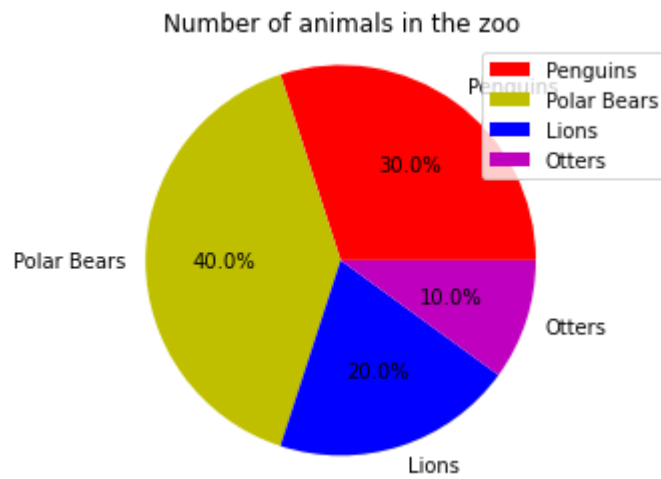
Part 2: Simple Charts

Pie Chart:
Make a pie chart that shows the distribution of animals in a zoo that conta
ins 30 penguins, 40 polar bears, 20 lions, and 10 otters.

Number of animals in the zoo

Bar Chart:
Make a bar chart that shows the number of people, out of a total of 40, who like various movie types if 10 people like comedy; 8 people like action; 15 people like romance; 2 people like drama, and 5 people like sci-fi.
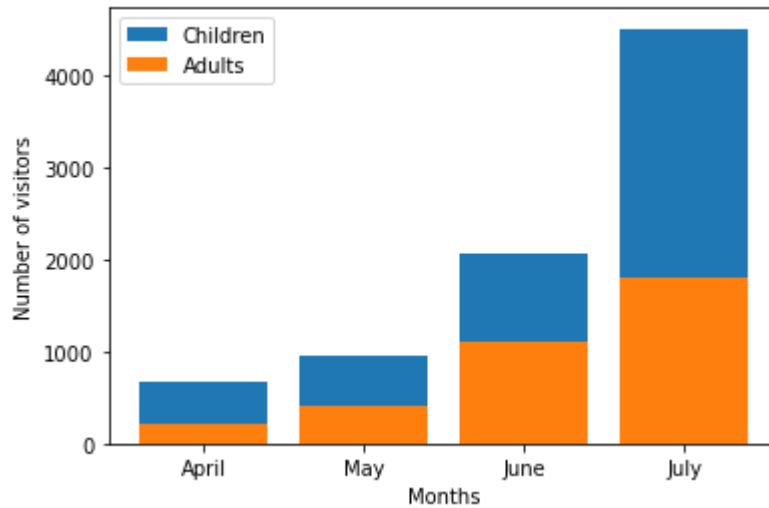

Movie Genre Vs Number of people
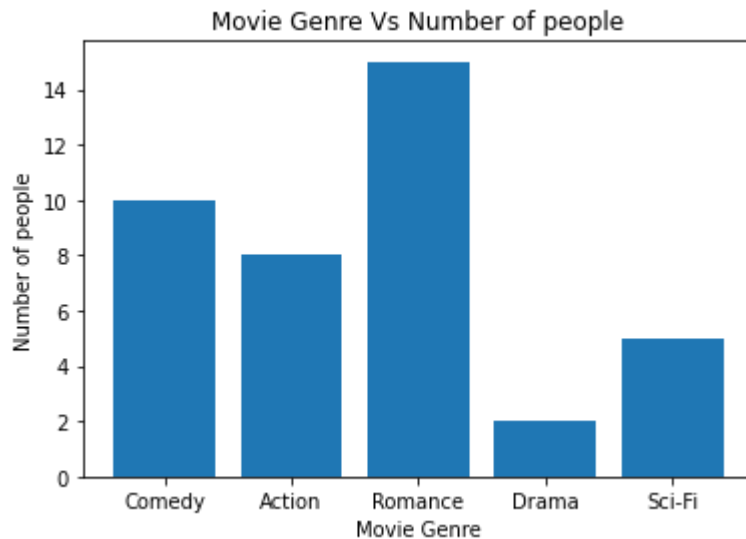
Grouped Bar Plots:
Make both a side-by-side bar plot and a stacked bar plot that displays the number of child visitors and the number of adult visitors at a waterpark in the months of April, May, June and July. Be sure to include titles, legends and appropriate labels sufficiently sized for readability.

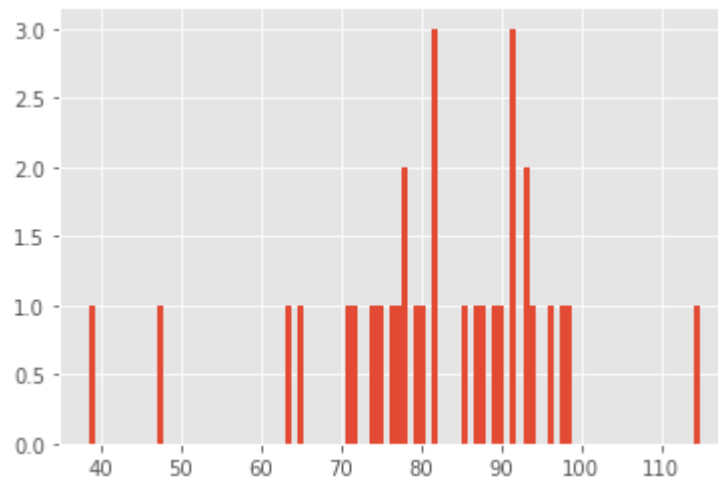## Side-by-side Bar Chart: Number of child and adult visitors at a waterpark

Legend: Children, Adults

Stacked Bar Chart: Number of child and adult visitors at a waterpark

Legend: Children, Adults

Y-axis: Number of visitors (0, 1000, 2000, 3000, 4000)
X-axis: Months (April, May, June, July)

Histogram:
Make a histogram of the following scores. Feel free to experiment on the best number of histogram bins for visualization.

In [ ]: