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Python Programming for Urban Planning
Series 2: Control Structures: Conditions and Loops
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Exercise 1:

Statement.
Write a Python script that takes a variable `building_height_meters` and categorizes the urban zone based on the following municipal rules:

- Less than 10 meters: Low-rise residential
- Between 10 and 30 meters (inclusive): Mid-rise mixed-use
- Greater than 30 meters: High-rise commercial

Test your code with `building_height_meters = 22` and print the resulting classification.
Solution.

```
building_height_meters = 22

if building_height_meters < 10:
    zone = "Low-rise residential"
elif building_height_meters <= 30:
    zone = "Mid-rise mixed-use"
else:
    zone = "High-rise commercial"

print(zone)
```

Exercise 2:

Statement.
You are given a list of populations for five different neighborhoods in a city:
`neighborhood_populations = [12000, 8500, 19400, 6200, 14100]`

1. Write a `for` loop to iterate through the list.
2. Calculate and print the **total population** of all neighborhoods combined.
3. Calculate and print the **average population** across these neighborhoods.

Solution.

```
neighborhood_populations = [12000, 8500, 19400, 6200, 14100]

total_population = 0
for population in neighborhood_populations:
    total_population += population

average_population = total_population / len(neighborhood_populations)

print("Total population:", total_population)
print("Average population:", average_population)
```

Exercise 3:

Statement.
A small town currently has a population of 5,000 inhabitants. It grows at a rate of 5% each year.

1. Write a `while` loop that simulates the population year by year.
2. Continue the loop as long as the population is strictly less than 10,000.
3. Keep track of the number of years elapsed. Print the final year count and the population once the threshold is reached.

Solution.

```
population = 5000
years = 0

while population < 10000:
    population = population * 1.05
    years += 1

print("Years elapsed:", years)
print("Population:", round(population))
```