Badji Mokhtar – Annaba University
Department of Urban Planning
Instructor: Dr. Hatem Zehir

Homework 1: Assessing Neighbourhoods for Urban Planning

Course: Python Workshop | **Language:** Python 3 | **Level:** Master 1 – Smart Urbanism | **Total:** 20 points

Student name: _____ Date: _____

Submission deadline: by email to `hatem.zehir@univ-annaba.dz` before **1 November 2026**.

Context and objectives

A planning department wants to identify neighbourhoods that may need additional public services. You will write a simple Python program to analyse population density and access to public services, using `if/elif/else`, `for` and `while`, correct indentation, variables, calculations and `input()`. Population is in inhabitants and area in km^2; **density = population / area**.

Population density (inhab./km^2)	Classification
Less than 1 500	Low density
From 1 500 to less than 5 000	Medium density
5 000 or more	High density

Access score	Interpretation
0–3	Poor access
4–6	Moderate access
7–10	Good access

Exercise 1: Classifying neighbourhood density (5 points)

1.1 Ask the user to enter the population and area of a neighbourhood.
1.2 Calculate the population density.
1.3 Use `if`, `elif` and `else` to classify the neighbourhood (density table above).
1.4 Display the population density and its classification.
1.5 Test with densities of 1 000, 3 000 and 6 000 inhabitants/km^2 and explain each classification.

Exercise 2: Analysing five neighbourhoods (7 points)

2.1 Use a `for` loop to repeat the analysis exactly five times.
2.2 At each iteration, ask for the neighbourhood's population and area (km^2).
2.3 Calculate the density and classify it using the rules of Exercise 1.
2.4 Display the neighbourhood number, its density and its classification.
2.5 Count the high-density neighbourhoods (initialise a counter before the loop).
2.6 After the loop, display the number of high-density neighbourhoods and their percentage of the five studied.

Exercise 3: Validating public-service access scores (5 points)

Residents rate their access to healthcare, schools and public transport with an integer from 0 (extremely poor) to 10 (excellent); any other value is invalid.

3.1 Ask the user to enter a service-access score.
3.2 Use a `while` loop to ask again while the value is less than 0 or greater than 10.
3.3 Classify the valid score using the interpretation table above.
3.4 Display the final valid score and its interpretation.
3.5 Explain why a `while` loop is appropriate for this exercise.

Exercise 4: Code comprehension and debugging (3 points)

```
density = 6000

if density >= 5000:
print("High density")
    print("Priority for further assessment")
else:
    print("Low or medium density")
```

4.1 Identify and correct the indentation error.

4.2 Modify the code so that it classifies low, medium and high density as in Exercise 1.

4.3 Explain why indentation matters in Python and what happens if the instructions inside an `if` block are not indented correctly.

Submission requirements

Submit one file named `Python_Homework1_Name_FamilyName.py` with your solutions to Exercises 1–3 and the corrected code of Exercise 4 (same file with clear headings, or a separate document). Add a short PDF or text document containing:

1. Screenshots or output of at least two tests for each exercise.
2. A brief explanation of how your `for` loop works.
3. A brief explanation of how your `while` loop terminates.
4. An explanation of when we use a `for` loop and when we use a `while` loop.
5. An explanation of the density thresholds you used.
6. One example of an error you encountered and how you corrected it.