# Question 1: Wire Length Analysis

You are given a list of wire lengths in micrometers from a layout design:  
```python  
lengths = [150.5, 210.7, 180.3, 145.6, 195.9, 200.0, 175.4]  
```  
Write a Python script to perform the following:

* a) Calculate and return the average wire length.
* b) Print all lengths greater than 180 micrometers.
* c) Find and print the shortest and longest wire.
* d) Round all lengths to the nearest 10 and print the new list.

# Question 2: Leakage Power from File

Assume you are provided with a file `leakage.txt` containing leakage power values in µW, one per line. Write a Python script to:

* a) Read all values from the file and store them in a list.
* b) Convert values to float and calculate total leakage.
* c) Print the count of all values above 50 µW.
* d) Sort and display all leakage values.

# Question 3: Setup Time Violation Categorization

Given the following list of setup time violations (in ns):  
```python  
violations = [0.2, 0.5, 0.0, 0.7, 0.4, 1.1]  
```  
Write a Python script to:

* a) Use a loop to print all violations greater than 0.5 ns.
* b) Count violations that are equal to 0.
* c) Create a new list with values rounded to 1 decimal place.
* d) For each value, print "OK" if violation == 0, "Minor" if < 0.5, and "Major" if ≥ 0.5.
* e) Display "Critical Timing Issue" if more than 2 violations are "Major".

# Question 4: Cell Type Dictionary Operations

You are given a dictionary of cells and their function in a standard cell library:  
```python  
cells = {"INV": "Inverter", "NAND": "Logic", "NOR": "Logic", "DFF": "FlipFlop", "BUF": "Buffer"}  
```  
Write a Python script to:

* a) Display all cell names (keys).
* b) Print only the logic gate types.
* c) Count how many cells are not logic gates.
* d) Create a list of cells excluding "Buffer".
* e) Print "Latch Not Found" if "LATCH" is not in the dictionary.

# Question 5: Voltage Reading Analysis

Write a Python script to analyze voltage readings (in mV).

* a) Accept 5 float voltage values from the user and store them in a list.
* b) Print values below 900 mV (under-voltage).
* c) Count how many values are above 1100 mV (over-voltage).
* d) For each value, print "Normal" if between 900–1100 mV, else "Alert".