Hand your completed quiz in before the due date. Do not forget to write down your **name and student ID number**. Marks will be awarded for this quiz based on the clarity of your answers. The marker will pay close attention to the logic of your answers. **Please show all your working.**

Q.1 Assume that the variable `data` refers to the dictionary `{‘b’:20, ‘a’:35}`. Write the values of the following expressions.

- a. `data[‘a’]`
- b. `data.get(‘c’, None)`
- c. `len(data)`
- d. `data.keys()`
- e. `data.values()`
- f. `data.pop(‘b’)`

Q.2 Assume that the variable `data` refers to the dictionary `{‘b’:20, ‘a’:35}`. Write a python code that does the following job:

- a. Replace the value at the key ‘b’ in `data` with your favorite number.
- b. Add the key/value pair ‘c’:40 to `data`.
- c. Remove the value at key ‘b’ in `data`.
- d. `data.keys()`
- e. `data.values()`
- f. `data.pop(‘b’)`.

Q.3 A group of statisticians at a local college has asked you to create a set of functions that compute the median and mode of a set of numbers. Define these functions in a module named `stats.py`. Also include a function named `mean`, which computes the average of a set of numbers. Each function should expect a list of numbers as an argument and return a single number. Each function should return 0 if the list is empty. Include a `main` function that tests the three statistical functions with a given list.

Q.4 The factorial of a positive integer `n`, `fact(n)` is defined recursively as follows:

- `fact(n) = 1`, when `n = 1`
- `fact(n) = n * fact(n-1)`, otherwise

Define a recursive function `fact` that returns the factorial of a given positive integer.

Q.5 Explain what happens when the following recursive function is called with the value 4 as an argument:

```python
def example(n):
    if n > 0:
        print(n)
        example(n)
    else:
        example(n-1)
```