JOMHACK
INSPIRE INNOVATION

PYTHON
BOOTCAMP

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DICTIONARIES

Dictionaries:

- Key-value data structure
- Key need to be unique
- Value can be duplicated

```
3   student = {
4       "name": "Alice",
5       "age": 20,
6       "grade": "A",
7       "courses": ["Math", "Science", "English"]
8   }
9
10  # Accessing and modifying
11  print(student["name"])                  # "Alice"
12  print(student.get("age"))               # 20
13  student["age"] = 21                     # Modify value
14  student["email"] = "alice@email.com"  # Add new key-value
```

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Dictionaries Method:

```
17    keys = student.keys()           # Get all keys
18    values = student.values()       # Get all values
19    items = student.items()         # Get key-value pairs
20
21    print(keys)
22    print(values)
23    print(items)
```

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Iterating Dictionaries:

```
25  # Iterating through dictionaries
26  for key in student:
27      print(f"{key}: {student[key]}")
28
29  for key, value in student.items():
30      print(f"{key}: {value}")
```

DICTIONARIES

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Nested Dictionaries:

```
32  # Nested dictionaries
33  company = {
34      "employees": {
35          "john": {"age": 30, "department": "IT"},
36          "jane": {"age": 25, "department": "HR"}
37      },
38      "departments": ["IT", "HR", "Finance"]
39  }
40
41  print(company["employees"].items())
42  print(company["departments"])
```

DICTIONARIES

Exercises:

1. Create a dictionary called student_records with the following information:
"student_001": name is "John", age is 19, major is "Computer Science", grades are [85, 92, 78]
"student_002": name is "Sarah", age is 20, major is "Biology", grades are [90, 88, 95]

2. Add a new student "student_003" with name "Mike", age 18, major "Math", grades [82, 79, 91]

3. Update John's age to 20

4. Loop through the dictionary and print each student's information in this format:
"Student ID: [id], Name: [name], Major: [major]"