In [1]:
```
# Fill in student ID and name
#
student_id = "223737376"
student_first_last_name = "Nawal"
print(student_id, student_first_last_name)
```

```
223737376 Nawal
```

In [7]:
```
import firebase_admin
from firebase_admin import credentials, db

databaseURL = "https://sit225n-default-rtdb.asia-southeast1.firebasedatabase.app/"


cred_obj = credentials.Certificate(
    r"C:\Users\jalmi\OneDrive\Desktop\w5N\sit225n-firebase-adminsdk-fbsvc-85b5c435
)

default_app = firebase_admin.initialize_app(cred_obj, {
    'databaseURL': databaseURL
})

ref = db.reference("/")
print(ref.get())
```

```
{'Book1': {'Author': 'J.R.R. Tolkien', 'Genre': 'Epic fantasy', 'Price': 100, 'Titl
e': 'The Fellowship of the Ring'}, 'Book2': {'Author': 'J.R.R. Tolkien', 'Genre':
'Epic fantasy', 'Price': 100, 'Title': 'The Two Towers'}, 'Book3': {'Author': 'J.R.
R. Tolkien', 'Genre': 'Epic fantasy', 'Price': 100, 'Title': 'The Return of the Kin
g'}, 'Book4': {'Author': 'Paulo Coelho', 'Genre': 'Fiction', 'Price': 100, 'Title':
'Brida'}, 'Sensors': {'DHT22': {'readings': {'-OYBXF-VXr87NtXWT1ey': {'humidity': 5
1.13, 'temperature': 32.32, 'timestamp': 1755778185901}, '-OYBXFJ1MUd9OfNmX9iQ':
{'humidity': 53.59, 'temperature': 27.82, 'timestamp': 1755778187577}, '-OYBXFbiBYn
e7aUkX5xw': {'humidity': 54.19, 'temperature': 28.11, 'timestamp': 1755778188829},
'-OYBXFvFaUw6ismMB8ay': {'humidity': 64.13, 'temperature': 32.18, 'timestamp': 1755
778190082}, '-OYBXGDwIP7GRSv_9Ukd': {'humidity': 57.65, 'temperature': 25.97, 'time
stamp': 1755778191340}}}, 'SR04': {'readings': {'-OYBXxsS6bwVx1oMVta7': {'distance_
cm': 34.97, 'timestamp': 1755778373811}, '-OYBXyB0TxAazJV-sL26': {'distance_cm': 18
3.91, 'timestamp': 1755778375479}, '-OYBXyUm1eQNr9EnP_rS': {'distance_cm': 170.46,
'timestamp': 1755778376727}, '-OYBXynBL8q-RfJ0M_-g': {'distance_cm': 111.36, 'times
tamp': 1755778377994}, '-OYBXz5gre_OBrt9hdXG': {'distance_cm': 133.8, 'timestamp':
1755778379237}}}}}
```

In [13]:
```
from firebase_admin import db

# A reference point is always needed to be set
# before any operation is carried out on a database.
#
ref = db.reference("/")

# JSON format data (key/value pair)
data = {  # Outer {} contains inner data structure
        "Book1":
        {
                "Title": "The Fellowship of the Ring",
                "Author": "J.R.R. Tolkien",
                "Genre": "Epic fantasy",
                "Price": 100
        },
```

```
        "Book2":
        {
                "Title": "The Two Towers",
                "Author": "J.R.R. Tolkien",
                "Genre": "Epic fantasy",
                "Price": 100
        },
        "Book3":
        {
                "Title": "The Return of the King",
                "Author": "J.R.R. Tolkien",
                "Genre": "Epic fantasy",
                "Price": 100
        },
        "Book4":
        {
                "Title": "Brida",
                "Author": "Paulo Coelho",
                "Genre": "Fiction",
                "Price": 100
        }
}

# JSON format data is set (overwritten) to the reference
# point set at /, which is the root node.
#
ref.set(data)
```

In [11]:

```
ref = db.reference("/")  # set ref point

# query all data under the ref
books = ref.get()
print(books)
print(type(books))

# print each item separately
for key, value in books.items():
    print(f"{key}: {value}")


# Query /Book1
ref = db.reference("/Book1")
books = ref.get()
print(books)
```

```
{'Book1': {'Author': 'J.R.R. Tolkien', 'Genre': 'Epic fantasy', 'Price': 100, 'Titl
e': 'The Fellowship of the Ring'}, 'Book2': {'Author': 'J.R.R. Tolkien', 'Genre':
'Epic fantasy', 'Price': 100, 'Title': 'The Two Towers'}, 'Book3': {'Author': 'J.R.
R. Tolkien', 'Genre': 'Epic fantasy', 'Price': 100, 'Title': 'The Return of the Kin
g'}, 'Book4': {'Author': 'Paulo Coelho', 'Genre': 'Fiction', 'Price': 100, 'Title':
'Brida'}}
<class 'dict'>
Book1: {'Author': 'J.R.R. Tolkien', 'Genre': 'Epic fantasy', 'Price': 100, 'Title':
'The Fellowship of the Ring'}
Book2: {'Author': 'J.R.R. Tolkien', 'Genre': 'Epic fantasy', 'Price': 100, 'Title':
'The Two Towers'}
Book3: {'Author': 'J.R.R. Tolkien', 'Genre': 'Epic fantasy', 'Price': 100, 'Title':
'The Return of the King'}
Book4: {'Author': 'Paulo Coelho', 'Genre': 'Fiction', 'Price': 100, 'Title': 'Brid
a'}
{'Author': 'J.R.R. Tolkien', 'Genre': 'Epic fantasy', 'Price': 100, 'Title': 'The F
ellowship of the Ring'}
```

In [15]:
```
# Write using push() function
# Note that a set() is called on top of push()
#
ref = db.reference("/")
ref.set({
        "Books":
        {
                "Best_Sellers": -1
        }
})

ref = db.reference("/Books/Best_Sellers")

for key, value in data.items():
        ref.push().set(value)
```

In [16]:
```
# Update data
#
# Requirement: The price of the books by
# J. R. R. Tolkien is reduced to 80 units to
# offer a discount.
#
ref = db.reference("/Books/Best_Sellers/")
best_sellers = ref.get()
print(best_sellers)
for key, value in best_sellers.items():
        if(value["Author"] == "J.R.R. Tolkien"):
                value["Price"] = 90
                ref.child(key).update({"Price":80})
```

```
{'-OYBgwlzSLpfRFUMlpSJ': {'Author': 'J.R.R. Tolkien', 'Genre': 'Epic fantasy', 'Pri
ce': 100, 'Title': 'The Fellowship of the Ring'}, '-OYBgwq_gBd9QGGtkdmT': {'Autho
r': 'J.R.R. Tolkien', 'Genre': 'Epic fantasy', 'Price': 100, 'Title': 'The Two Towe
rs'}, '-OYBgwv4ldf_1kfyjMCX': {'Author': 'J.R.R. Tolkien', 'Genre': 'Epic fantasy',
'Price': 100, 'Title': 'The Return of the King'}, '-OYBgwyrEyWmJPKElnxY': {'Autho
r': 'Paulo Coelho', 'Genre': 'Fiction', 'Price': 100, 'Title': 'Brida'}}
```

In [17]:
```
# Let's delete all best seller books
# with J.R.R. Tolkien as the author.
#
ref = db.reference("/Books/Best_Sellers")
```

```
for key, value in best_sellers.items():
        if(value["Author"] == "J.R.R. Tolkien"):
                ref.child(key).set({})
```

In [18]:
```
# Delete all best_seller data.
#
ref = db.reference("/Books/Best_Sellers/")
best_sellers = ref.get()
print(best_sellers)
print(type(best_sellers))
```

```
{'-OYBgwyrEyWmJPKElnxY': {'Author': 'Paulo Coelho', 'Genre': 'Fiction', 'Price': 10
0, 'Title': 'Brida'}}
<class 'dict'>
```

In [ ]:
```
ref = db.reference("/Books/Best_Sellers")
ref.set({})
```