

## Activity\_main =>

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:padding="20dp">

    <EditText
        android:id="@+id/etRoll"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:hint="Enter Roll Number"
        android:inputType="number"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent"/>

    <EditText
        android:id="@+id/etName"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:hint="Enter Student Name"
        app:layout_constraintTop_toBottomOf="@+id/etRoll"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        android:layout_marginTop="16dp"/>

    <EditText
        android:id="@+id/etMarks"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:hint="Enter Marks"
        android:inputType="number"
        app:layout_constraintTop_toBottomOf="@+id/etName"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        android:layout_marginTop="16dp"/>
```

```
<com.google.android.material.floatingactionbutton.FloatingActionButton
    android:id="@+id/fabAdd"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_margin="16dp"
    android:layout_marginStart="32dp"
    android:layout_marginBottom="16dp"
    android:contentDescription="Add"
    android:src="@android:drawable/ic_input_add"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintStart_toStartOf="parent" />

<com.google.android.material.floatingactionbutton.FloatingActionButton
    android:id="@+id/fabRead"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:contentDescription="Read"
    android:src="@android:drawable/ic_menu_search"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintStart_toEndOf="@+id/fabAdd"
    android:layout_margin="16dp" />

<com.google.android.material.floatingactionbutton.FloatingActionButton
    android:id="@+id/fabEdit"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:contentDescription="Update"
    android:src="@android:drawable/ic_menu_edit"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintStart_toEndOf="@+id/fabRead"
    android:layout_margin="16dp" />

<com.google.android.material.floatingactionbutton.FloatingActionButton
    android:id="@+id/fabDelete"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_margin="16dp"
    android:layout_marginStart="112dp"
    android:layout_marginBottom="24dp"
    android:contentDescription="Delete"
    android:src="@android:drawable/ic_menu_delete"
```

```
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintStart_toEndOf="@+id/fabEdit" />

</androidx.constraintlayout.widget.ConstraintLayout>
```

### **Student.kt =>**

```
package com.example.ca1

data class Student(
    var roll: Int? = null,
    var name: String? = null,
    var marks: String? = null
)
```

### **MainActivity.kt =>**

```
package com.example.ca1

import android.os.Bundle
import android.widget.EditText
import android.widget.Toast
import androidx.activity.enableEdgeToEdge
import androidx.appcompat.app.AppCompatActivity
import com.google.android.material.floatingactionbutton.FloatingActionButton
import com.google.firebase.database.DatabaseReference
import com.google.firebaseio.database.FirebaseDatabase

class MainActivity : AppCompatActivity() {
    private lateinit var etRoll: EditText
    private lateinit var etName: EditText
    private lateinit var etMarks: EditText
    private lateinit var btnRead: FloatingActionButton
    private lateinit var btnAdd: FloatingActionButton
    private lateinit var btnEdit: FloatingActionButton
    private lateinit var btnDelete: FloatingActionButton
    private lateinit var database: DatabaseReference

    override fun onCreate(savedInstanceState: Bundle?) {
```

```
super.onCreate(savedInstanceState)
enableEdgeToEdge()
setContentView(R.layout.activity_main)

etRoll = findViewById(R.id.etRoll)
etName = findViewById(R.id.etName)
etMarks = findViewById(R.id.etMarks)
btnAdd = findViewById(R.id.fabAdd)
btnRead = findViewById(R.id.fabRead)
btnEdit = findViewById(R.id.fabEdit)
btnDelete = findViewById(R.id.fabDelete)

database = FirebaseDatabase.getInstance().getReference("Students")

btnAdd.setOnClickListener {
    val roll = etRoll.text.toString().toIntOrNull()
    val name = etName.text.toString()
    val marks = etMarks.text.toString()

    if (roll != null && name.isNotEmpty() && marks.isNotEmpty()) {
        val student = Student(roll, name, marks)

        database.child(roll.toString()).setValue(student)
            .addOnSuccessListener {
                Toast.makeText(this, "Student Added", Toast.LENGTH_SHORT).show()
            }
            .addOnFailureListener {
                Toast.makeText(this, "Error: ${it.message}", Toast.LENGTH_SHORT).show()
            }
    } else {
        Toast.makeText(this, "Fill all fields", Toast.LENGTH_SHORT).show()
    }
}

btnRead.setOnClickListener {
    val roll = etRoll.text.toString()

    if (roll.isNotEmpty()) {
        database.child(roll).get()
            .addOnSuccessListener {
                if (it.exists()) {
```

```

        val name = it.child("name").value
        val marks = it.child("marks").value

        etName.setText(name.toString())
        etMarks.setText(marks.toString())

        Toast.makeText(this, "Student Found", Toast.LENGTH_SHORT).show()
    } else {
        Toast.makeText(this, "Student Not Found", Toast.LENGTH_SHORT).show()
    }
}

} else {
    Toast.makeText(this, "Enter Roll No", Toast.LENGTH_SHORT).show()
}
}

btnEdit.setOnClickListener {
    val roll = etRoll.text.toString()
    val name = etName.text.toString()
    val marks = etMarks.text.toString()

    if (roll.isNotEmpty() && name.isNotEmpty() && marks.isNotEmpty()) {
        val student = Student(roll.toInt(), name, marks)

        database.child(roll).setValue(student)
            .addOnSuccessListener {
                Toast.makeText(this, "Student Updated", Toast.LENGTH_SHORT).show()
            }
            .addOnFailureListener {
                Toast.makeText(this, "Error: ${it.message}", Toast.LENGTH_SHORT).show()
            }
    } else {
        Toast.makeText(this, "Fill all fields", Toast.LENGTH_SHORT).show()
    }
}

btnDelete.setOnClickListener {
    val roll = etRoll.text.toString()

    if (roll.isNotEmpty()) {
        database.child(roll).removeValue()
    }
}

```

```
.addOnSuccessListener {
    Toast.makeText(this, "Student Deleted", Toast.LENGTH_SHORT).show()

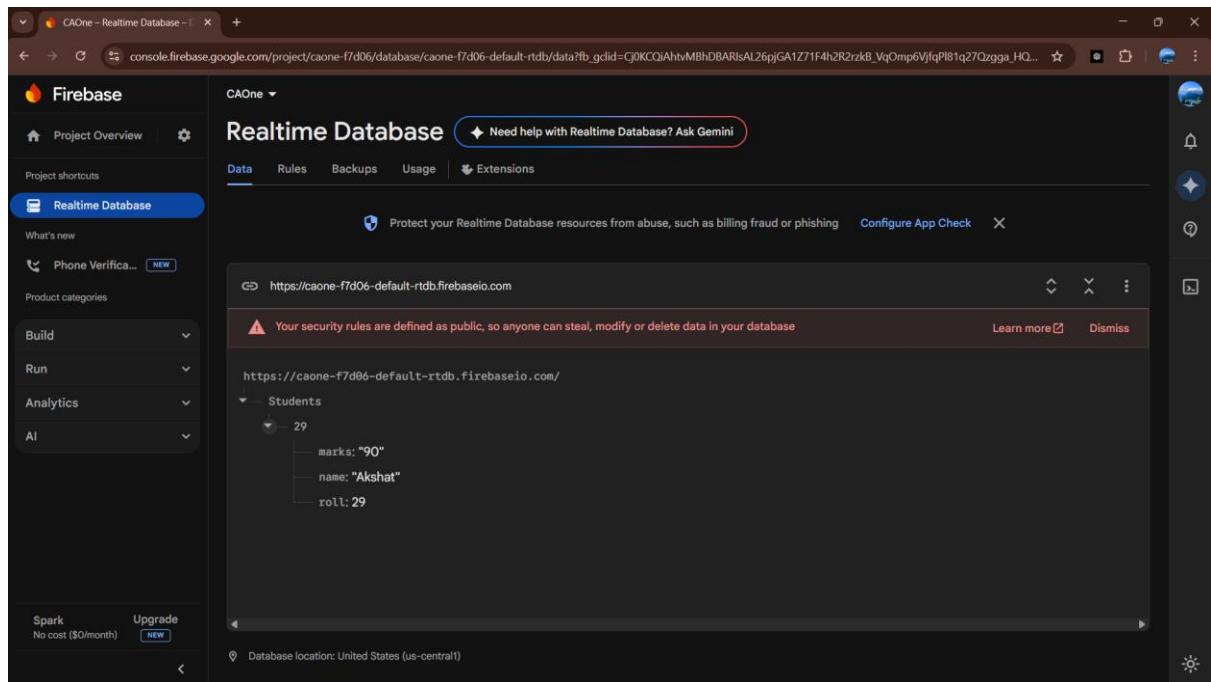
    etRoll.text.clear()
    etName.text.clear()
    etMarks.text.clear()
}

.addOnFailureListener {
    Toast.makeText(this, "Error: ${it.message}", Toast.LENGTH_SHORT).show()
}

} else {
    Toast.makeText(this, "Enter Roll No", Toast.LENGTH_SHORT).show()
}

}
}
```

## Firebase =>



## Output =>

The screenshot shows the Android Studio interface with the code editor and a preview window.

**Code Editor (MainActivity.kt):**

```
12 class MainActivity : AppCompatActivity() {
13     override fun onCreate(savedInstanceState: Bundle?) {
14         super.onCreate(savedInstanceState)
15         enableEdgeToEdge()
16         setContentView(R.layout.activity_main)
17
18         etRoll = findViewById(R.id.etRoll)
19         etName = findViewById(R.id.etName)
20         etMarks = findViewById(R.id.etMarks)
21         btnAdd = findViewById(R.id.btnAdd)
22         btnRead = findViewById(R.id.btnRead)
23         btnEdit = findViewById(R.id.btnEdit)
24         btnDelete = findViewById(R.id.btnDelete)
25
26         database = FirebaseDatabase.getInstance().getReference("Students")
27
28         btnAdd.setOnClickListener {
29             val roll = etRoll.text.toString().toIntOrNull()
30             val name = etName.text.toString()
31             val marks = etMarks.text.toString()
32
33             if (roll != null && name.isNotEmpty() && marks.isNotEmpty()) {
34                 val student = Student(roll, name, marks)
35
36                 database.child(pathString = roll.toString()).setValue(student)
37                     .addOnSuccessListener {
38                         Toast.makeText(context, "Student Added", Toast.LENGTH_SHORT).show()
39                     }
40                     .addOnFailureListener {
41                         Toast.makeText(context, "Error: ${it.message}", Toast.LENGTH_SHORT).show()
42                     }
43             } else {
44                 Toast.makeText(context, "Fill all fields", Toast.LENGTH_SHORT).show()
45             }
46         }
47
48         btnRead.setOnClickListener {
49             val roll = etRoll.text.toString()
50
51             if (roll.isNotEmpty()) {
52                 database.child(pathString = roll).get()
53                     .addOnSuccessListener {
54                         if (it.exists()) {
55                             etName.setText(it.child("name").value.toString())
56                             etMarks.setText(it.child("marks").value.toString())
57                         }
58                     }
59             }
60         }
61     }
62 }
```

**Preview Window:**

The preview window shows a simple UI with three text input fields labeled "Enter Roll Number", "Enter Student Name", and "Enter Marks". Below the fields are four floating action button icons: a plus sign, a magnifying glass, a pencil, and a trash can.