



UNIVERZITET U NIŠU ELEKTRONSKI FAKULTET
Katedra za računarstvo



COVID19-STATISTICS

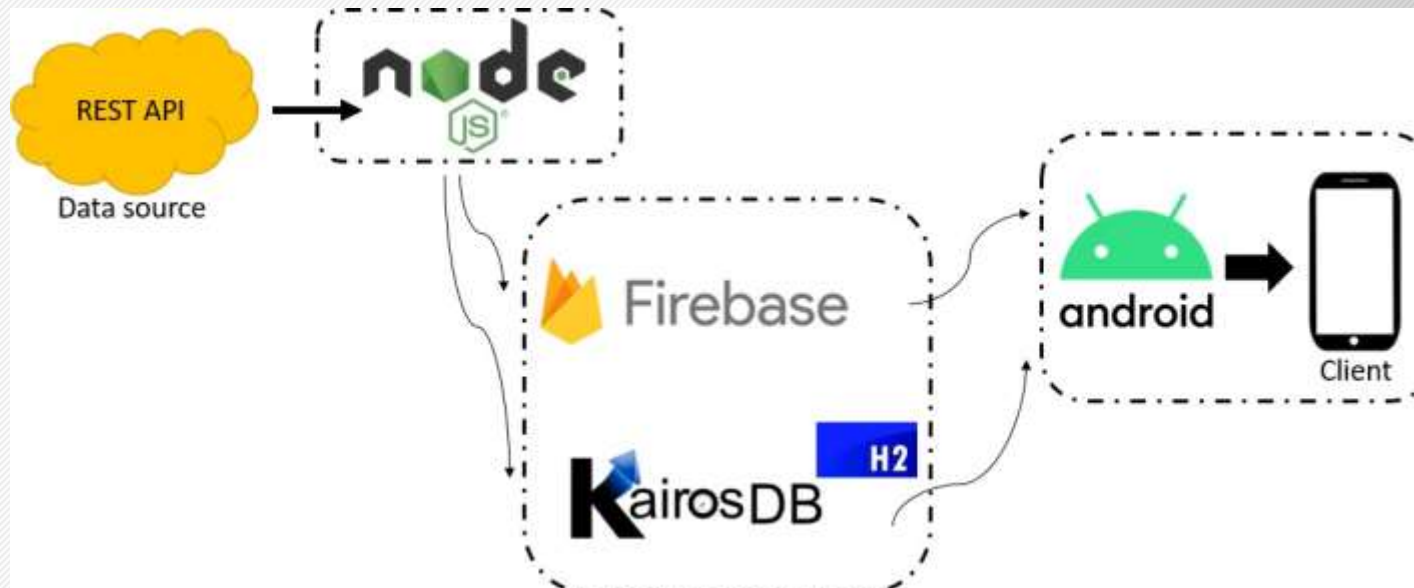
-Informacione tehnologije za razvoj sistema e-Uprave-

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Arhitektura sistema

- Izvor podataka
- Skripta za prikupljanje i smeštanje podataka u bazu podataka
- Baza podataka
- Android aplikacija – klijentska aplikacija



Izvor podataka

- <https://about-corona.net/documentation>
- <https://corona-api.com/countries>
- <https://corona-api.com/countries/AF>

```
{
  "data": {
    "coordinates": {
      "latitude": 33,
      "longitude": 65
    },
    "name": "Afghanistan",
    "code": "AF",
    "population": 29121286,
    "updated_at": "2021-11-02T17:35:47.227Z",
    "today": {
      "deaths": 0,
      "confirmed": 0
    },
    "latest_data": {
      "deaths": 7198,
      "confirmed": 155819,
      "recovered": 123527,
      "critical": 24294,
      "calculated": {
        "death_rate": 4.643381788812984,
        "recovery_rate": 79.68587886228139,
        "recovered_vs_death_ratio": null,
        "cases_per_million_population": 1124
      }
    }
  },
  "coordinates": {
    "latitude": 41,
    "longitude": 20
  },
  "name": "Albania",
  "code": "AL",
  "population": 2986952,
  "updated_at": "2021-11-02T17:35:47.227Z",
  "today": {
    "deaths": 0,
    "confirmed": 0
  },
}
```

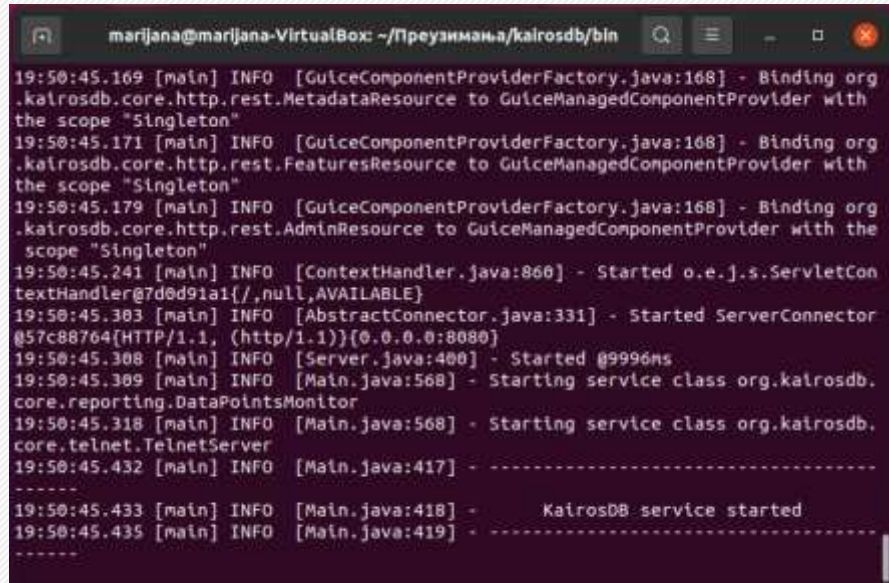
```
{
  "data": {
    "coordinates": {
      "latitude": 33,
      "longitude": 65
    },
    "name": "Afghanistan",
    "code": "AF",
    "population": 29121286,
    "updated_at": "2021-11-02T17:15:52.335Z",
    "today": {
      "deaths": 0,
      "confirmed": 0
    },
    "latest_data": {
      "deaths": 7198,
      "confirmed": 155819,
      "recovered": 123527,
      "critical": 24294,
      "calculated": {
        "death_rate": 4.643381788812984,
        "recovery_rate": 79.68587886228139,
        "recovered_vs_death_ratio": null,
        "cases_per_million_population": 1124
      }
    }
  },
  "timeline": {
    {
      "updated_at": "2021-11-02T04:22:03.000Z",
      "date": "2021-11-02",
      "deaths": 7281,
      "confirmed": 156284,
      "recovered": 0,
      "new_confirmed": 34,
      "new_recovered": 0,
      "new_deaths": 1,
      "active": 149883
    },
    {
      "updated_at": "2021-11-01T04:22:01.000Z",
      "date": "2021-11-01",
    }
  }
}
```

Izvor podataka

Atribut	Značenje
coordinates	Koordinate države
name	Ime države
code	Kod/skraćeni naziv
population	Populacija države
updated_at	Dan poslednjeg ažuriranja podataka
today	Podaci tog dana
latest_data	Poslednji podaci
deaths	Broj smrtnih slučajeva
confirmed	Ukupan broj potvrđenih slučajeva
recoverd	Ukupan broj oporavljenih
critical	Broj kritičnih slučajeva
calculated	Podaci o stopi umrlih, oporavljenih
date	Datum kada su zabeleženi podaci
new_confirmed	Potvrđeni slučajevi tog dana
new_recovered	Oporavljeni slučajevi tog dana
new_deaths	Premинуli slučajevi tog dana
active	Aktivni slučajevi u tom momentu

Baza podataka – KairosDB baza podataka

> ./kairosdb.sh run



```
marijana@marijana-VirtualBox: ~/Преузимања/kairosdb/bin
19:50:45.169 [main] INFO [GuiceComponentProviderFactory.java:168] - Binding org
.kairosdb.core.http.rest.MetadataResource to GuiceManagedComponentProvider with
the scope "Singleton"
19:50:45.171 [main] INFO [GuiceComponentProviderFactory.java:168] - Binding org
.kairosdb.core.http.rest.FeaturesResource to GuiceManagedComponentProvider with
the scope "Singleton"
19:50:45.179 [main] INFO [GuiceComponentProviderFactory.java:168] - Binding org
.kairosdb.core.http.rest.AdminResource to GuiceManagedComponentProvider with the
scope "Singleton"
19:50:45.241 [main] INFO [ContextHandler.java:866] - Started o.e.j.s.ServletCon
textHandler@7d0d91a1[/,null,AVAILABLE]
19:50:45.303 [main] INFO [AbstractConnector.java:331] - Started ServerConnector
@57c88764(HTTP/1.1, (http/1.1)){0.0.0.0:8080}
19:50:45.308 [main] INFO [Server.java:400] - Started @9996ns
19:50:45.309 [main] INFO [Main.java:568] - Starting service class org.kairosdb.
core.reporting.DataPointsMonitor
19:50:45.318 [main] INFO [Main.java:568] - Starting service class org.kairosdb.
core.telnet.TelnetServer
19:50:45.432 [main] INFO [Main.java:417] - -----
19:50:45.433 [main] INFO [Main.java:418] - KairosDB service started
19:50:45.435 [main] INFO [Main.java:419] - -----
```

> ./kairosdb.sh start

> ./kairosdb.sh stop

Baza podataka – KairosDB baza podataka

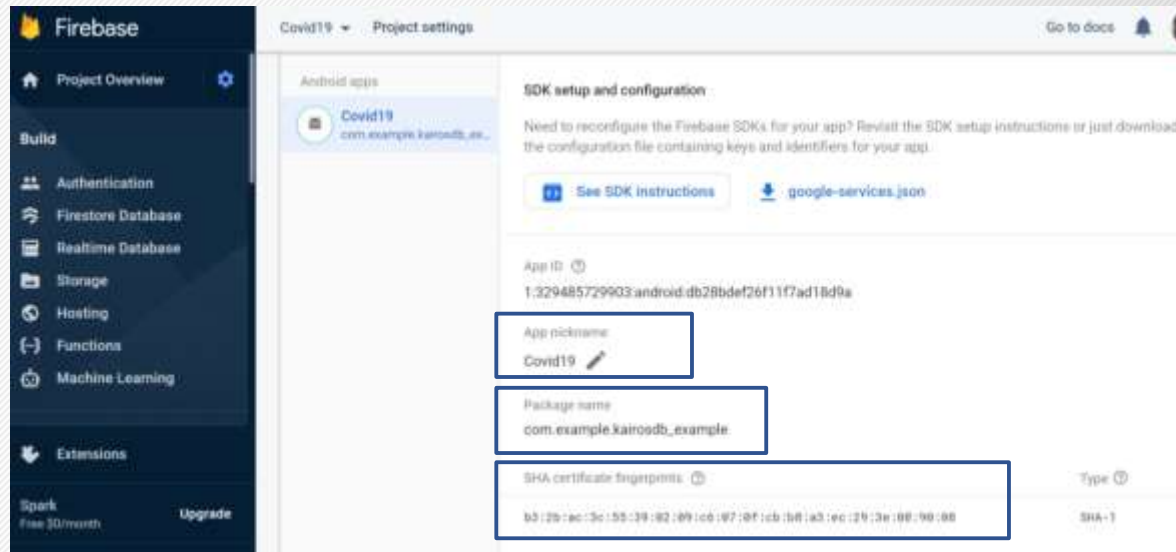
- Skladištenje podataka po danima za svaku državu, gde se pamte podaci o brojevima zabeleženih slučajeva, preminulih i oporavljenih u tom danu
- Svaka od država ima tri metrike koja pamti po danima ove podatke (npr. za Austriju: at_new_confirmed, at_new_deaths, at_new recovered), kao i ukupne brojeve (at_confirmed, at_deaths, at_recovered)
- POST zahtev, <http://192.168.0.27:8080/api/v1/datapoints/query>

```
1 {
2   "start_absolute": 1635721200000,
3   "end_absolute": 1637103600000,
4   "metrics": [
5     {
6       "name": "at_new_confirmed"
7     }
8   ]
9 }
```

```
{
  "queries": [
    {
      "sample_size": 16,
      "results": [
        {
          "name": "at_new_confirmed",
          "group_by": [
            {
              "name": "type",
              "type": "number"
            }
          ],
          "tags": {
            "host": [
              "test"
            ]
          },
          "values": [
            [
              1635724800000,
              5684
            ],
            [
              1635811200000,
              4523
            ],
            [
              1635897600000,
              5398
            ],
            [
              1635984000000,
              6506
            ],
            [
              1636070400000,
              8594
            ]
          ]
        }
      ]
    }
  ],
  "tags": {
    "host": [
      "test"
    ]
  },
  "values": [
    [
      1636416000000,
      8178
    ],
    [
      1636502400000,
      7712
    ],
    [
      1636588800000,
      11398
    ],
    [
      1636675200000,
      11975
    ],
    [
      1636761600000,
      11798
    ],
    [
      1636848000000,
      13152
    ],
    [
      1636934400000,
      11552
    ],
    [
      1637020800000,
      11889
    ]
  ]
}
```

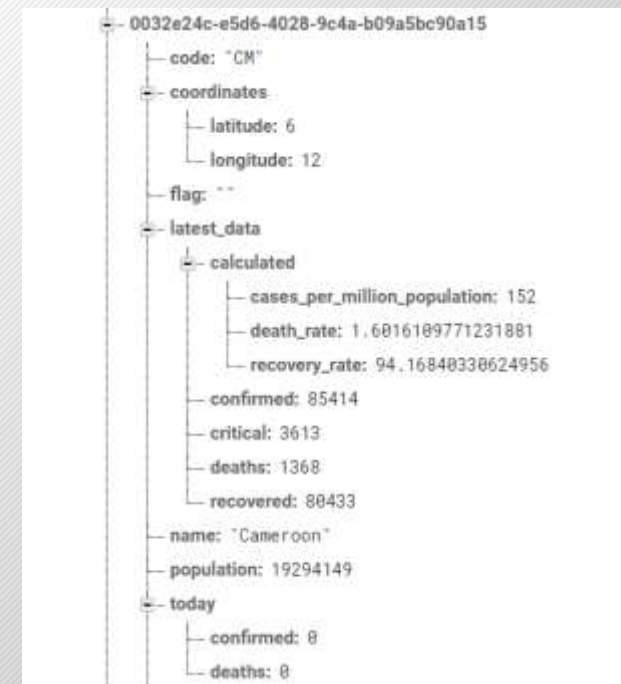
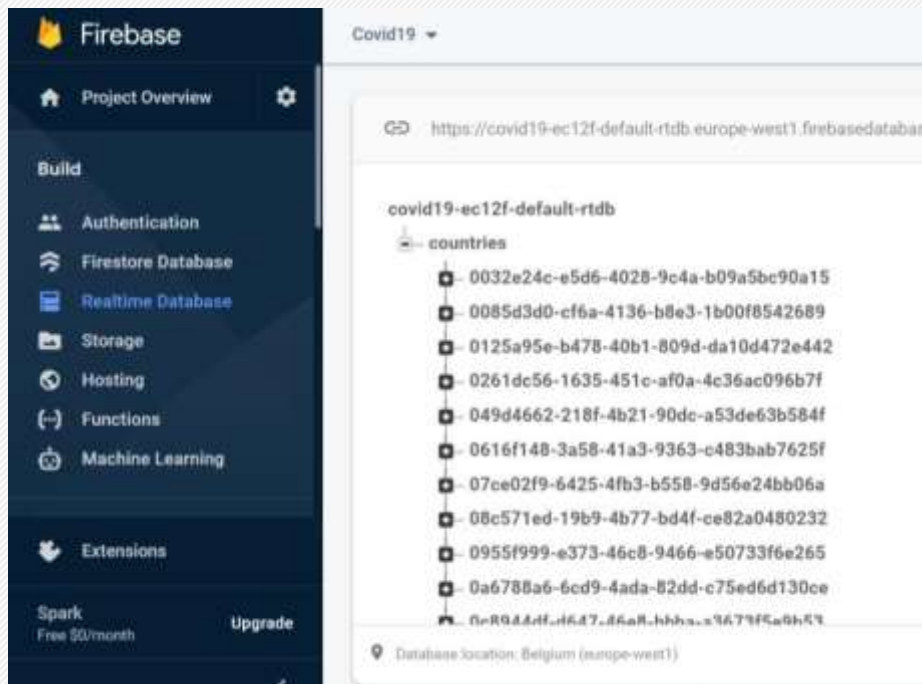
Baza podataka – Firebase

- Firebase pruža backend usluge i usluge računarstva u oblaku
- Pruža najpre bazu podataka za rad u realnom vremenu koja pruža aplikacioni programski interfejs (API) koji omogućava programerima da skladište i sinhronizuju podatke preko različitih klijenata



Baza podataka – Firebase

- Podaci za svaku državu: kod države (CM), koordinate, ukupan broj registrovanih slučajeva zaraze u toj državi, ukupan broj smrtnih slučajeva, broj oporavljenih



Skripta za prikupljanje i skladištenje podataka

- Za prikupljanje podataka iz izvora podataka i skladištenje tih podataka u KairosDb i Firebase bazu podataka
- Node.js

```
//https://corona-api.com/countries
options = {
  hostname: 'corona-api.com',
  port: 443,
  path: '/countries',
  method: 'GET'
}
```

```
options = {
  hostname: kairosdbip,
  port: 8080,
  path: '/api/v1/datapoints',
  method: 'POST',
  headers: {
    'Content-Type': 'application/json',
    'Content-Length': jsonData.length
  }
}

let req = http.request(options, res => {
})

req.on('error', error => console.log(error))

req.write(jsonData)
req.end()
```

```
array = []

parsedData.data.timeline.forEach(timestamp => {
  const temp = []
  temp.push(new Date(timestamp.date).getTime())
  temp.push(timestamp.new_confirmed)
  array.push(temp)
})

jsonData = new TextEncoder().encode(
  JSON.stringify({
    name: `${country.code.toLowerCase()}_new_confirmed`,
    datapoints: array,
    tags: { 'host': 'test' }
  })
)
```

- ```
const val KAIROS_DB_SERVER_IP = "http://192.168.0.31:8080"
```

- 
- The image displays three screenshots of the Android Studio interface, showing the project structure of an Android application named 'com.example.kalroodb\_example'.
- Left Screenshot (Project Manager):** Shows the overall project structure. The 'app' module is expanded, revealing subfolders: 'build', 'libs', 'src' (containing 'androidTest', 'main', and 'test'), and 'res'. The 'main' folder is further expanded to show the 'java' package, which contains the package 'com.example.kalroodb\_example'. This package includes subfolders for 'activities', 'adapters', 'datamodels', and 'utils', as well as 'AndroidManifest.xml' and a 'test' folder.
- Middle Screenshot (activities):** Focuses on the 'activities' package. It lists the following classes: 'AggregationActivity', 'CompareCountriesActivity', 'CountriesActivity', 'PreCompareActivity', 'PreviewCompareCountriesGraphActivity', 'PreviewCountryActivity', and 'PreviewGraphActivity'.
- Right Screenshot (adapters):** Focuses on the 'adapters' package. It lists the following classes: 'AggregationAdapter', 'CountriesAdapter', and 'PreCompareAdapter'.
- Bottom Screenshot (datamodels):** Focuses on the 'datamodels' package. It lists the following classes: 'Country', 'FirebaseCountry', 'FirebaseCountryCalculated', 'FirebaseCountryCoordinates', 'FirebaseCountryLatestData', 'FirebaseCountryToday', and 'PreCompareCountry'.
- Bottom Screenshot (utils):** Focuses on the 'utils' package. It lists the following classes: 'Constants', 'JsonPlaceholderApi', 'PostType', and 'Side'.

# Klijentska aplikacija - Android

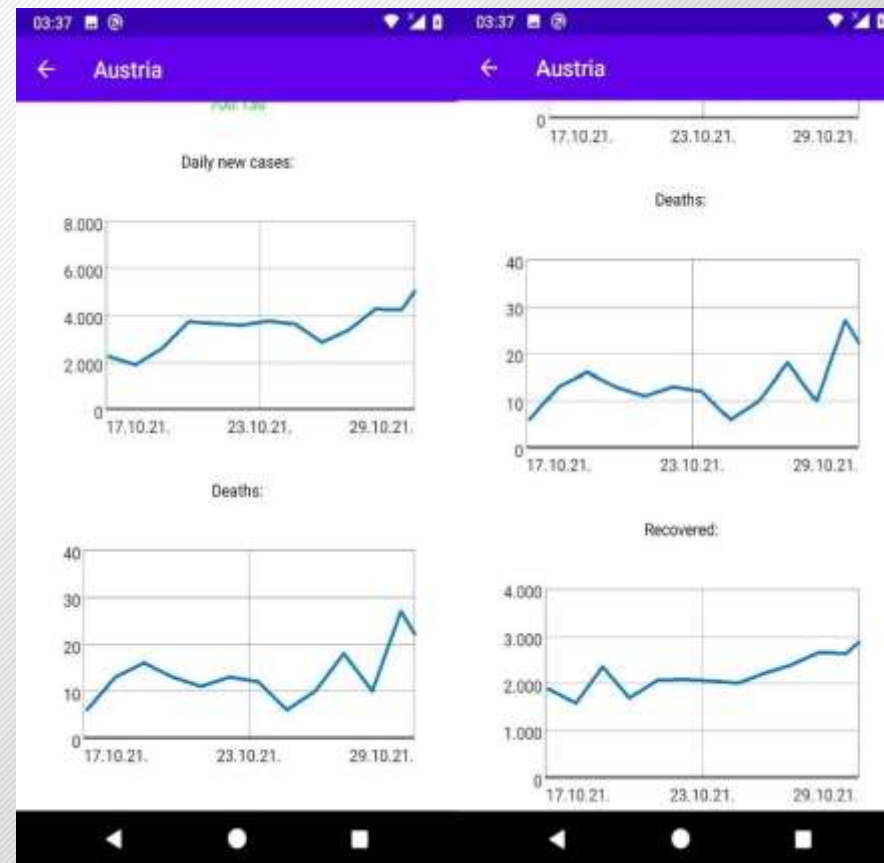
```
maxValueDate = keyList[maxValueIndex]
val calendar = Calendar.getInstance()
calendar.timeInMillis = minDate
mBinding.minConfirmedPlaceholder.text =
 "${minValue} on date ${SimpleDateFormat("dd/MM/yyyy").format(calendar.time)}"
calendar.timeInMillis = maxDate
mBinding.maxConfirmedPlaceholder.text =
 "${maxValue} on date ${SimpleDateFormat("dd/MM/yyyy").format(calendar.time)}"
val lineGraphSeries = LineGraphSeries<DataPoint>()
val minDate = Date()
minDate.time = minDate
val maxDate = Date()
maxDate.time = maxDate

if (minDate > maxDate) {
 lineGraphSeries.appendData(DataPoint(
 maxDate,
 maxValue.toDouble(),
 isConfirmed: true, maxDataPoints: 100))
}
```

```
data class FirebaseCountry(
 val code: String = "",
 val name: String = "",
 val population: Int = 0,
 val flag: String = "",
 val coordinates: FirebaseCountryCoordinates? = null,
 val latest_data: FirebaseCountryLatestData? = null,
 val updated_at: String = "",
 val today: FirebaseCountryToday? = null
)
```

```
object Constants {
 const val TAG = "debugTag"
 const val KAIROS_DB_SERVER_IP = "http://192.168.0.27:8080"
 const val START_ABSOLUTE = 1572562800000 // 1 November 2019
 val END_ABSOLUTE = System.currentTimeMillis() //current date
}
```

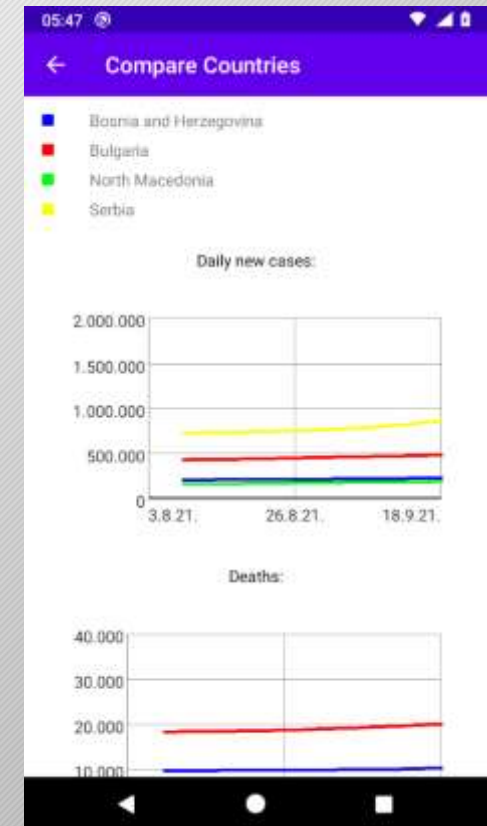
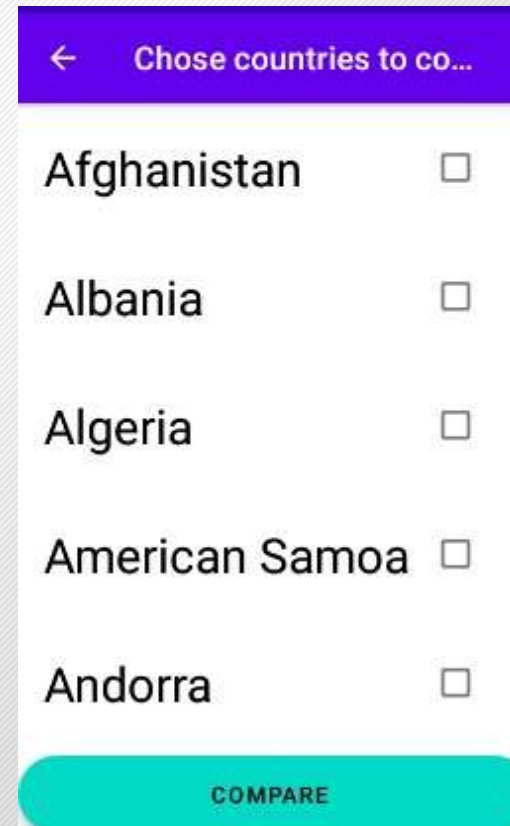
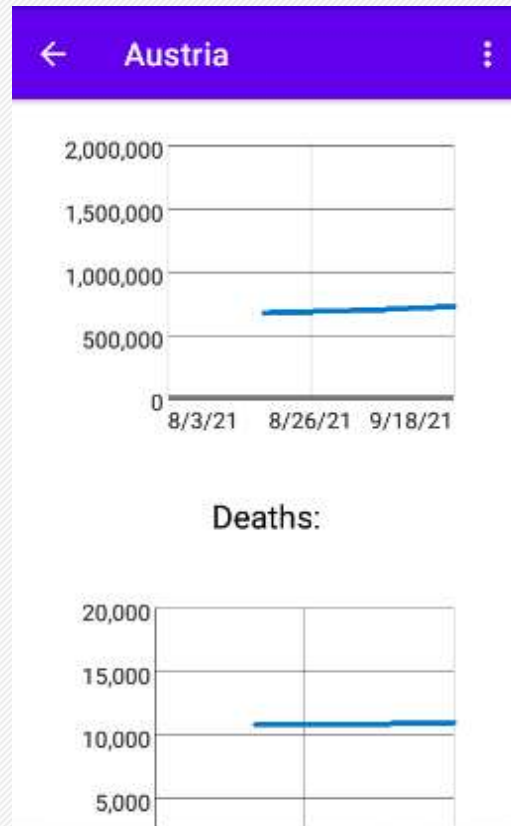
# Primer rada sistema



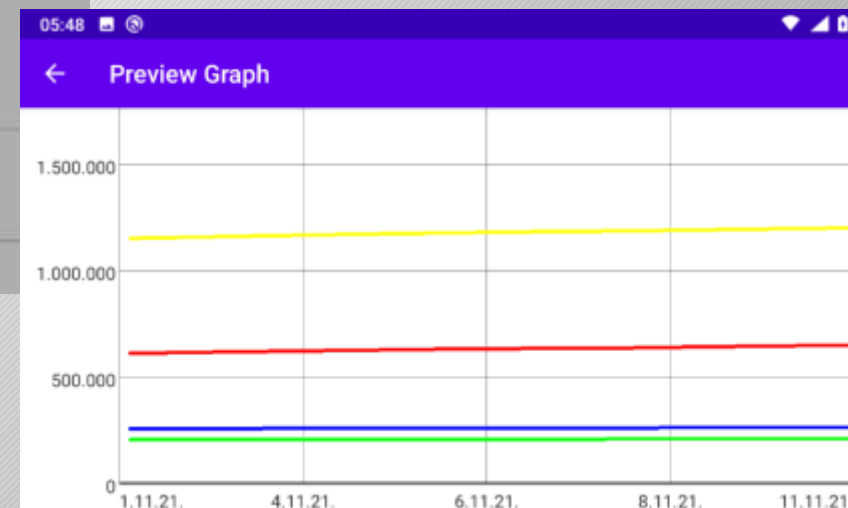
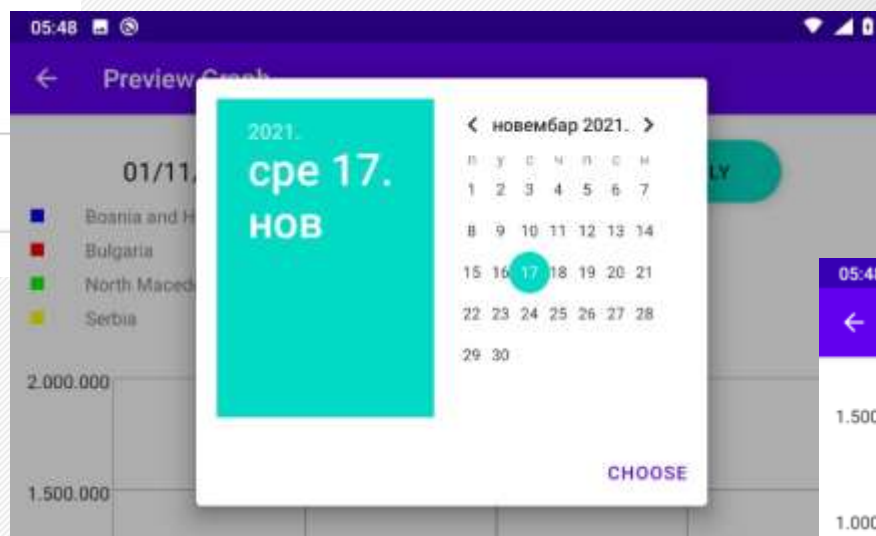
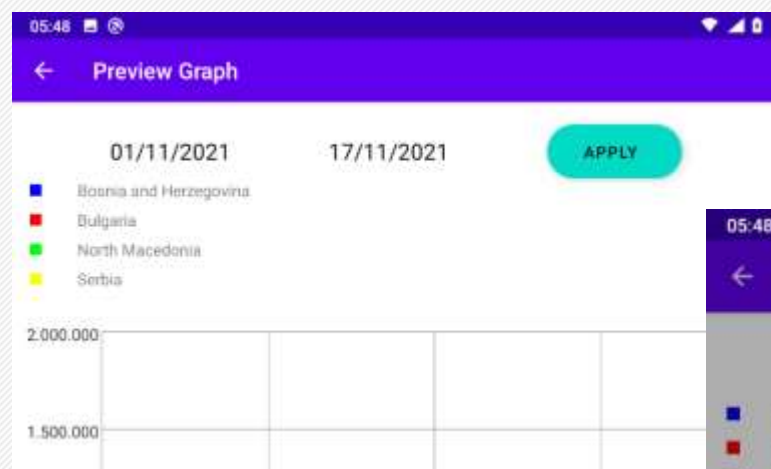


# Primer rada sistema

- Compare

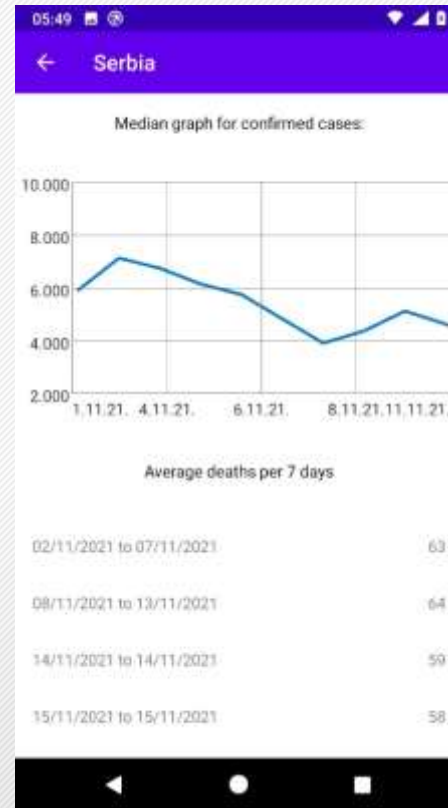


# Primer rada sistema



# Primer rada sistema

- Aggregation



# HVALA NA PAŽNJI!

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