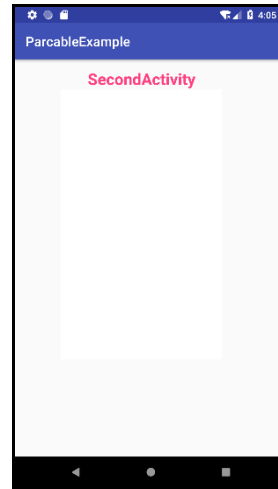**OBJECTIVES:** Intent + Constraint Layout

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STEP 1. Open another activity.

- Create two activities (MainActivity, SecondActivity). Over app folder right click and select **New**, select **Activity,** select **Empty Activity** and then give the second activity class name and xml file name.

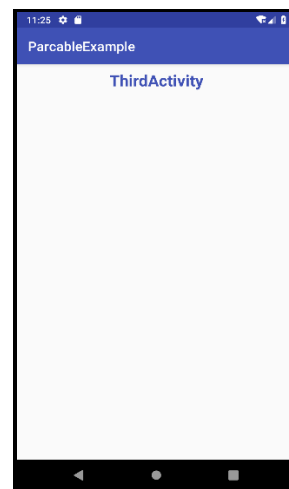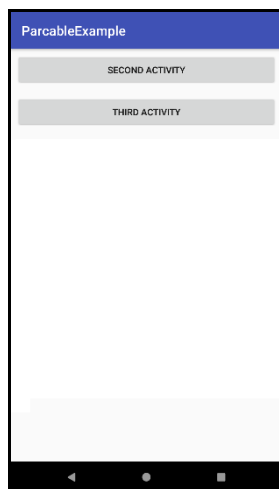- If user clicks on the **SECOND ACTIVITY** button, second activity will be opened.

    MainActivity;

```
public void onClick(View view) {
    Intent intent = = new Intent(this, SecondActivity.class);
    startActivity(intent);
}
```

- Run your application and see that second activity can be opened.

STEP 2. Open another activity.

- **Create third activity (ThirdActivity) and add THIRD ACTIVITY Button to MainActivity.**
- If user clicks on the **THIRD ACTIVITY** button, ThirdActivity will be opened.

- Modify the onClick method of MainActivity;
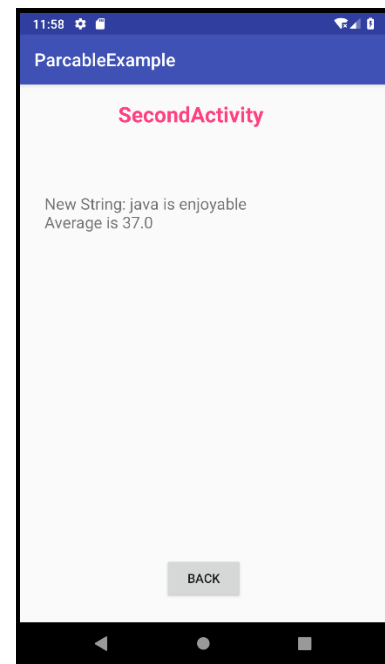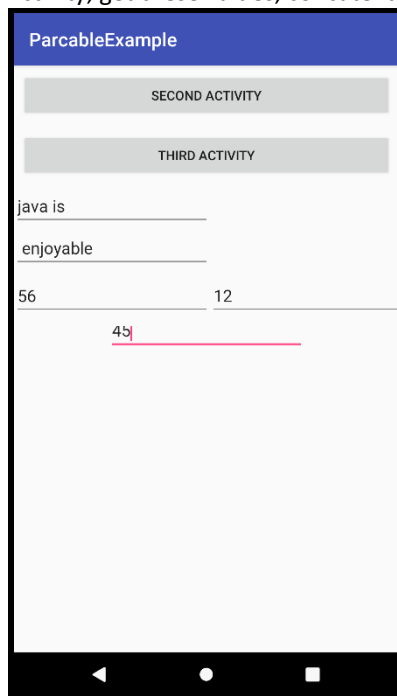
```java
public void onClick(View view) {
    switch (view.getId()) {
        case R.id.btn_second:
            intent = new Intent(this, SecondActivity.class);
            break;

        case R.id.btn_third:
            intent = new Intent(this, ThirdActivty.class);
            break;
    }
    startActivity(intent);
}
```

- Run your application and see that SecondActivity and ThirdActivity can be opened.

STEP 3. Send data to another activity
- Add Five EditText on MainActivity
- When SECOND ACTIVITY button is clicked, edit text values will send to SecondActivity
- Form the Second Activity, get these values, concatenate first two string and find the average of three integers.

- Modify the **onClick** method of **MainActivity** to send data. You may use **direct** or **bundle** method.

```java
public void onClick(View view) {
        Intent intent = null;
        if (view.getId() == R.id.btnSecond) {

                intent = new Intent(this, SecondActivity.class);
                curentRequestcode = requestCode1;
                int num1 = Integer.parseInt(etNum1.getText().toString());
                int num2 = Integer.parseInt(etNum2.getText().toString());
                int num3 = Integer.parseInt(etNum3.getText().toString());
                String str1 = etStr1.getText().toString();
                String str2 = etStr2.getText().toString();

                Bundle b = new Bundle();
                b.putInt("num1", num1);
                b.putInt("num2", num2);
                b.putInt("num3", num3);
                b.putString("str1",str1);
                b.putString("str2",str2);

                intent.putExtras(b);
        } else if (view.getId() == R.id.btnThird) {
            intent = new Intent(this, ThirdActivity.class);
            curentRequestcode = requestCode2;
    }
    startActivity(intent);
}
```

- Modify the **onCreate** method of **SecondActivity** to **get data**. If you use direct method in MainActivity, to get the data use direct method. If Bundle method is used in MainActivity, to get data use bundle method.

```
public void onCreate(…) {
    … … … …
    tvRes = findViewById(R.id.txtRes);
    intent = getIntent();

    Bundle b = intent.getExtras();
    int num1 = b.getInt("num1");
    int num2 = b.getInt("num2");
    int num3 = b.getInt("num3");
    String str1 = b.getString("str1");
    String str2 = b.getString("str2");
    double res = (num1+num2+num3) / 3;
    String str = str1.concat(str2);

    tvRes.setText("New String: "+str);
    tvRes.append("\nAverage is " + res  );

    … … … …
}
```
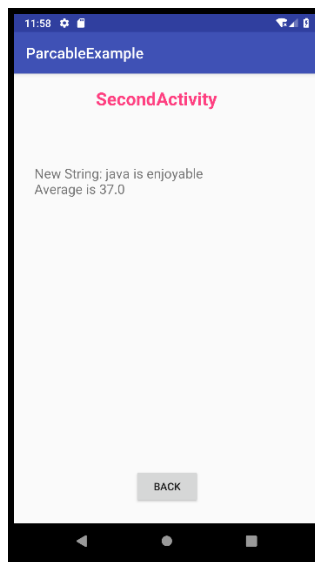
STEP 3.When SecondActivity is closed, return to the MainActivity.

- Put the button **BACK** in second and third activities. When the user click on these buttons, current activity will be closed and execution will returned to the MainActivity.

- Write onClick method for the BACK buttons of SecondActivity and ThirdActivity

```
public void onClick(View view) {
        finish();
}
```

- Modify the **onClick** method of the **MainActivity**
  Instead of `startActivity(intent)` use `startActivityForResult(intent,curentRequestcode);`

```
int requestCode1 = 1;
int requestCode1 = 2;
…. … …
… … …
 public void onClick(View view) {
 Intent intent = null;
 if (view.getId() == R.id.btnSecond) {

    intent = new Intent(this, SecondActivity.class);
    curentRequestcode = requestCode1;
    int num1 = Integer.parseInt(etNum1.getText().toString());
    int num2 = Integer.parseInt(etNum2.getText().toString());
```

```
        int num3 = Integer.parseInt(etNum3.getText().toString());
        String str1 = etStr1.getText().toString();
        String str2 = etStr2.getText().toString();

        Bundle b = new Bundle();
        b.putInt("num1", num1);
        b.putInt("num2", num2);
        b.putInt("num3", num3);
        b.putString("str1",str1);
        b.putString("str2",str2);

        intent.putExtras(b);

    } else if (view.getId() == R.id.btnThird) {
        intent = new Intent(this, ThirdActivity.class);
        curentRequestcode = requestCode2;
    } else if (view.getId() == R.id.btnCreate) {
        intent = new Intent(this, ThirdActivity.class);
        curentRequestcode = requestCode2;
        Bundle b = new Bundle();
        b.putParcelable("book", book);
        intent.putExtras(b);
    }
    startActivityForResult(intent, curentRequestcode);
}
```

STEP 4.When SecondActivity is closed, execution will returned to the MainActivity and send data/result to the MainActivity.

- Modify the **onClick** method of the **SecondActivity;**

```
public void onClick(View view) {
    Intent intent = new Intent();
    intent.putExtra("res",msg);
    //msg is the calculated result.
    //Direct or bundle method can be used to send data to the MainActivity which is the caller of
    //SecondActivity
    setResult(RESULT_OK, intent);
    finish();
}
```

- From the MainActivity, to get data/result(s) from SecondActivity override the **onActivityResult**() method in the MainActivity

```
protected void onActivityResult(int requestCode, int resultCode, @Nullable Intent data) {
        if(resultCode == RESULT_OK){
            String msg = data.getStringExtra("res");

        }
}
```

STEP 5. (Send an object to another activity)

- Import a spinner with three book type "ART, MUSIC, SCIENCE"**.**
- When the user selects the book type from the spinner, create Book object according to the users choice
- When THIRD ACTIVITY button is clicked, send book object to the ThirdActivity and display book information on ThirdActivity.
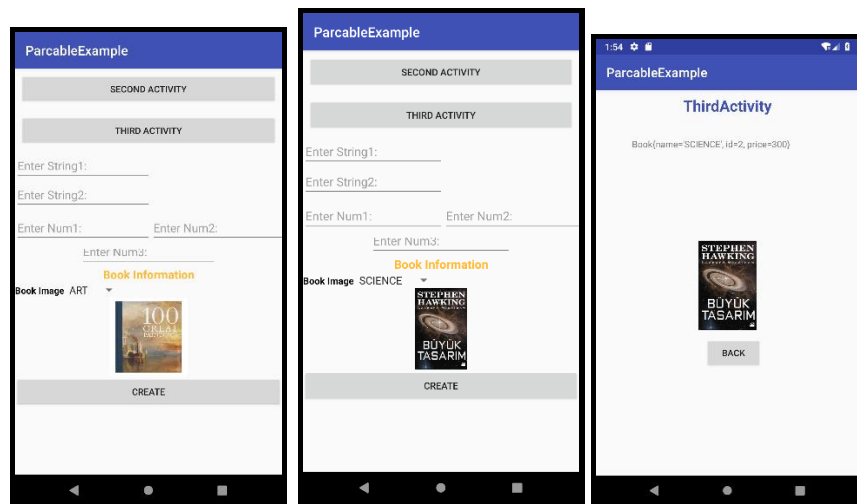
- Define an integer array to store image ids in MainActivity.
  - Int[] imgIds = {R.drawable.art, R.drawable.science, R.drawable.music}

- Create **Book** class

```java
import android.os.Parcel;
import android.os.Parcelable;
public class Book implements Parcelable {

    String name;
    int id;
    int price;
    int imgId;

    public Book(String name, int id, int price,int imgId) {
        this.name = name;
        this.id = id;
        this.price = price;
        this.imgId = imgId;
    }

    protected Book(Parcel in) {
        name = in.readString();
        id = in.readInt();
        price = in.readInt();
        imgId = in.readInt();
    }

    @Override
    public void writeToParcel(Parcel dest, int flags) {
        dest.writeString(name);
        dest.writeInt(id);
        dest.writeInt(price);
        dest.writeInt(imgId);
    }

    public static final Creator<Book> CREATOR = new Creator<Book>() {
        @Override
        public Book createFromParcel(Parcel in) {
            return new Book(in);
        }

        @Override
        public Book[] newArray(int size) {
            return new Book[size];
        }
    };
    public int describeContents() {
        return 0;
    }


    public String getName() {
        return name;
    }

    public int getId() {
        return id;
    }

    public int getPrice() {
        return price;
    }

    public void setName(String name) {
        this.name = name;
    }

    public void setId(int id) {
        this.id = id;
    }

    public void setPrice(int price) {
        this.price = price;
    }

    public int getImgId() {
        return imgId;
    }
}
```

```java
    public void setImgId(int imgId) {
            this.imgId = imgId;
    }
    @Override
    public String toString() {
            return "Book{" +
                    "name='" + name + '\'' +
                    ", id=" + id +
                    ", price=" + price +
                    '}';
    }

    @Override
}
```

- Modify the **onCreate** method of the **MainActivity** to catch the item selected event of spinner.

```java
public void onCreate(…) {
    … … … …
    //Spinner Selection
    spBook.setOnItemSelectedListener(new AdapterView.OnItemSelectedListener() {
                @Override
                public void onItemSelected(AdapterView<?> parent, View view, int i, long l) {
                        if (i == 0) {
                                book = new Book("ART", 1, 2500,ImgIds[0]);
                                img.setImageResource(R.drawable.art);
                        } else if (i == 1) {
                                img.setImageResource(R.drawable.science);
                                book = new Book("SCIENCE", 2, 300,ImgIds[1]);
                        } else {

                                img.setImageResource(R.drawable.music);
                                book = new Book("MUSIC", 3, 3500,ImgIds[2]);
                        }
                }
                @Override
                public void onNothingSelected(AdapterView<?> adapterView) {
                }
        });
    … … …
```

- Modify the **onClick** method of the **MainActivity to send book object to ThirdActivity.**

```java
    public void onClick(View view) {
            Intent intent = null;
            if (view.getId() == R.id.btnSecond) {
                intent = new Intent(this, SecondActivity.class);
                curentRequestcode = requestCode1;
                int num1 =  Integer.parseInt(etNum1.getText().toString());
                int num2 =  Integer.parseInt(etNum2.getText().toString());

                Bundle b = new Bundle();
                b.putInt("num1",num1);
                b.putInt("num2",num2);
                intent.putExtras(b);

            } else if (view.getId() == R.id.btnThird) {
                intent = new Intent(this, ThirdActivity.class);
                curentRequestcode = requestCode2;
                Bundle b = new Bundle();
                b.putParcelable("book", book);
                intent.putExtras(b);

            }
            startActivityForResult(intent,curentRequestcode);

    }
```

- Modify the **onCreate** method of the **ThirdActivity** to get book object.
```java
public void onCreate(…) {
    … … … …
    txtBook = findViewById(R.id.txtBook);
    img = findViewById(R.id.imgBook);
    intent = getIntent();
    Bundle b = intent.getExtras();
    Book book = (Book) b.getParcelable("book");
    txtBook.setText(book.toString());
    img.setImageResource(book.getImgId());

}
```

STEP 6.When ThirdActivity is closed, execution will returned to the MainActivity and send data/result(s) to the MainActivity.

- Modify the **onClick** method of the **ThirdActivity;**

```
public void onClick(View view) {
    Intent intent = new Intent();
    intent.putExtra("res",msg);
    //msg value is "Object book recived"
    setResult(RESULT_OK, intent);
    finish();
}
```

- From the MainActivity, to get data/result(s) from ThirdActivity , **modify** the `onActivityResult`() method in the MainActivity. Remember, this method also will be called when secondActivity is closed. So, you need to identify from which activity execution is returned to MainActivity.

```
protected void onActivityResult(int requestCode, int resultCode, @Nullable Intent data) {
    if(resultCode == RESULT_OK){
        String msg = data.getStringExtra("res");

        if(requestCode == requestCode1){ //Return from Secondactivity
            Toast.makeText(this,msg, Toast.LENGTH_LONG ).show();
        }
        else { //Return form Main Activity
            makeAndShowDialog("Comes from ThirdActivity.");
        }
    }
}
```