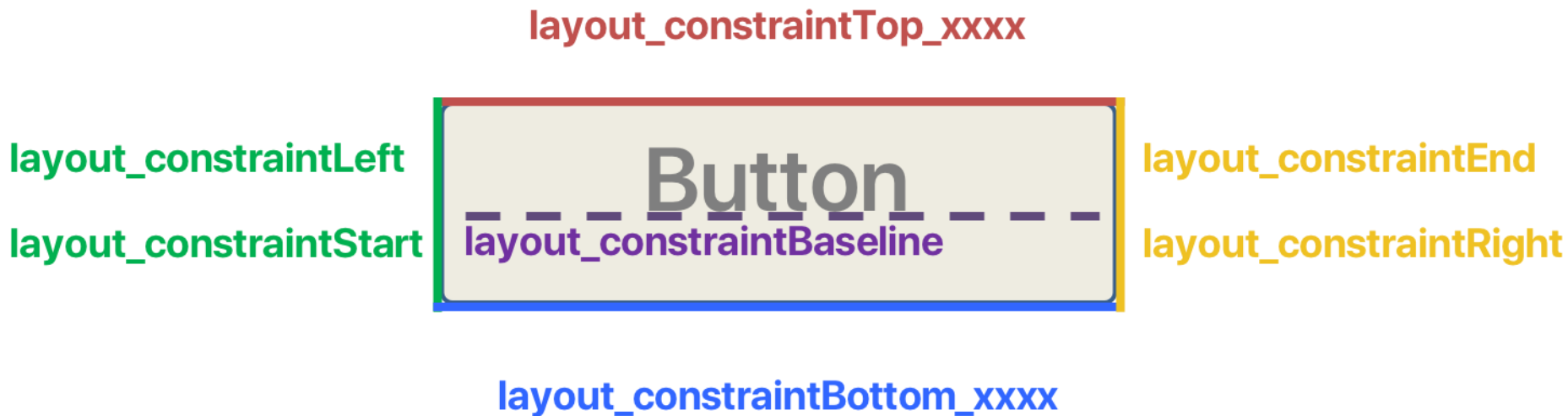


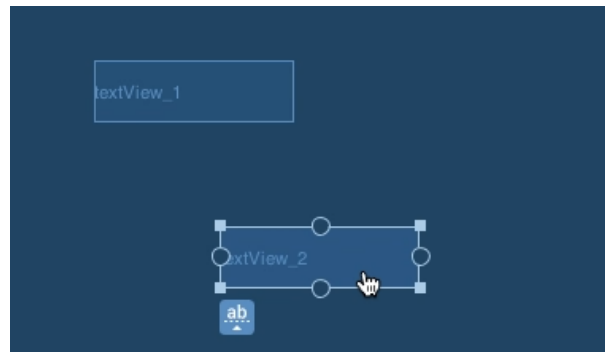
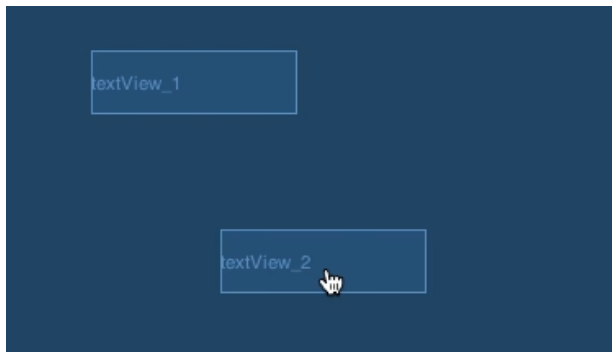
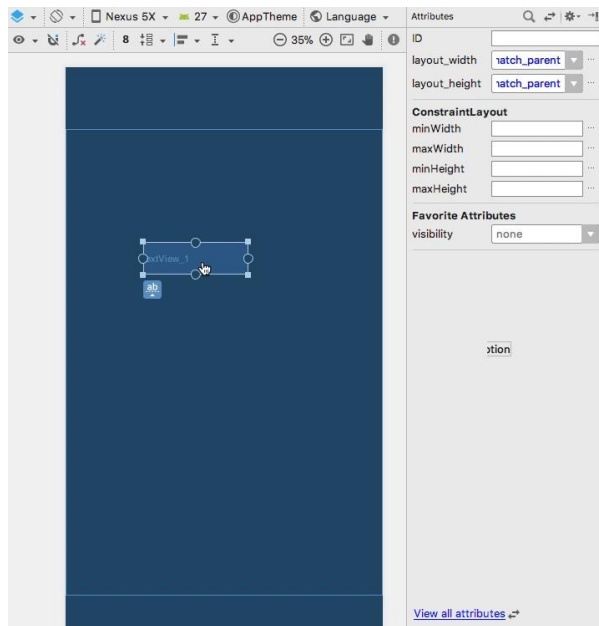
ConstraintLayout

Layout constraints



ConstraintLayout

Align top edges



```
<TextView
    android:id="@+id/tv_1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="24dp"
    app:layout_constraintTop_toTopOf="parent"/>
```

```
<TextView
    android:id="@+id/tv_1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"/>
```

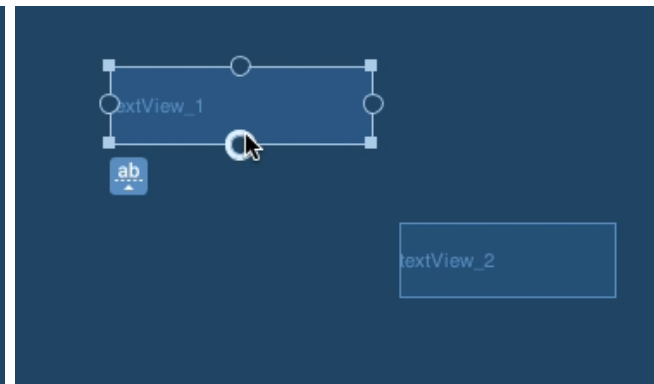
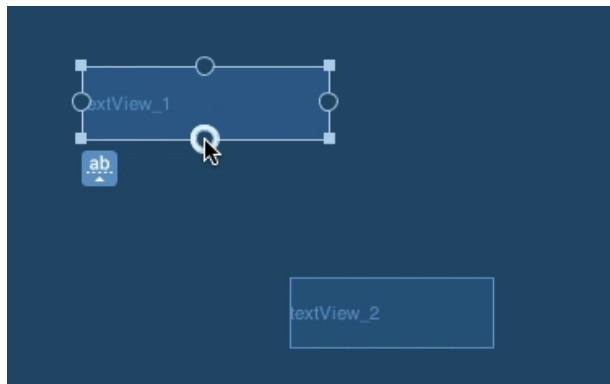
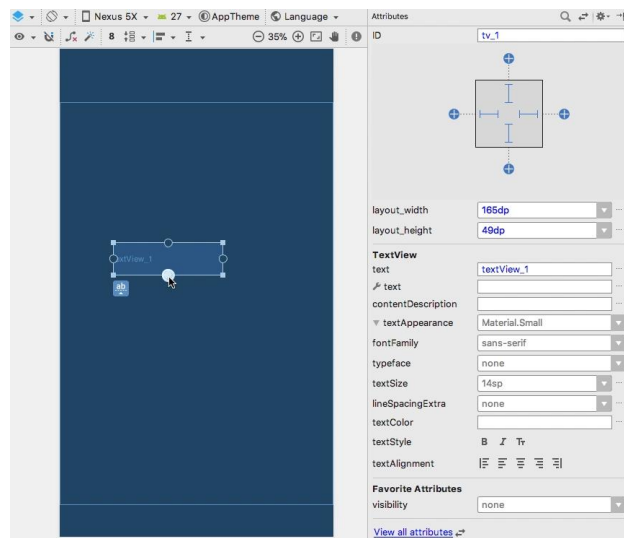
```
<TextView
    android:id="@+id/tv_2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="32dp"
    app:layout_constraintTop_toBottomOf="@+id/tv_1"/>
```

```
<TextView
    android:id="@+id/tv_1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"/>
```

```
<TextView
    android:id="@+id/tv_2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="48dp"
    app:layout_constraintTop_toTopOf="@+id/tv_1"/>
```

ConstraintLayout

Align bottom edges



```
<TextView
    android:id="@+id/tv_1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginBottom="24dp"
    app:layout_constraintBottom_toBottomOf="parent"/>
```

```
<TextView
    android:id="@+id/tv_1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginBottom="44dp"
    app:layout_constraintBottom_toTopOf="@+id/tv_2"/>
```

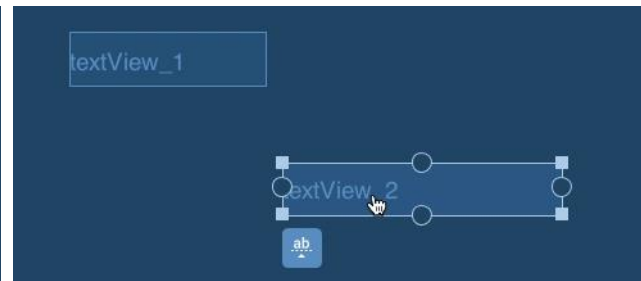
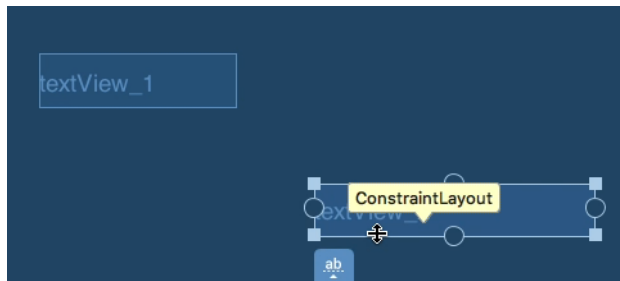
```
<TextView
    android:id="@+id/tv_2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"/>
```

```
<TextView
    android:id="@+id/tv_1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginBottom="60dp"
    app:layout_constraintBottom_toBottomOf="@+id/tv_2"/>
```

```
<TextView
    android:id="@+id/tv_2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"/>
```

ConstraintLayout

Align left edges



```
<TextView
    android:id="@+id/tv_1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginEnd="32dp"
    app:layout_constraintStart_toStartOf="parent"/>
```

```
<TextView
    android:id="@+id/tv_1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"

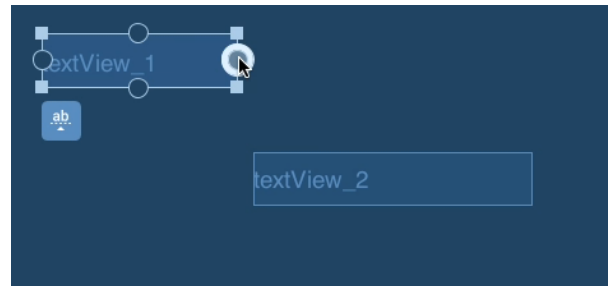
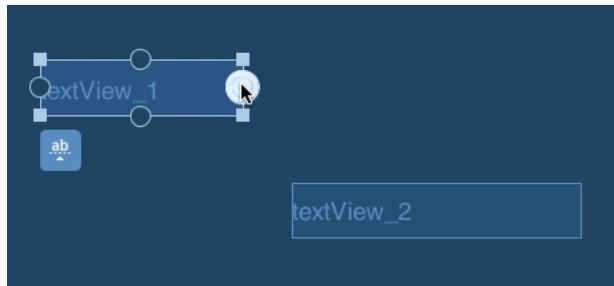
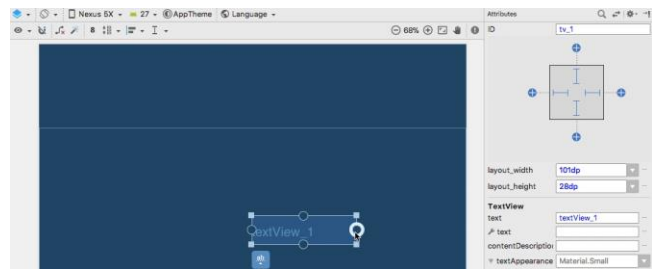
<TextView
    android:id="@+id/tv_2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginStart="24dp"
    app:layout_constraintStart_toEndOf="@+id/tv_1"/>
```

```
<TextView
    android:id="@+id/tv_1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"

<TextView
    android:id="@+id/tv_2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginStart="36dp"
    app:layout_constraintStart_toStartOf="@+id/tv_1"/>
```

ConstraintLayout

Align right edges



```
<TextView
    android:id="@+id/tv_1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginEnd="32dp"
    app:layout_constraintEnd_toEndOf="parent"/>
```

```
<TextView
    android:id="@+id/tv_1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginEnd="32dp"
    app:layout_constraintEnd_toStartOf="@+id/tv_2"/>
```

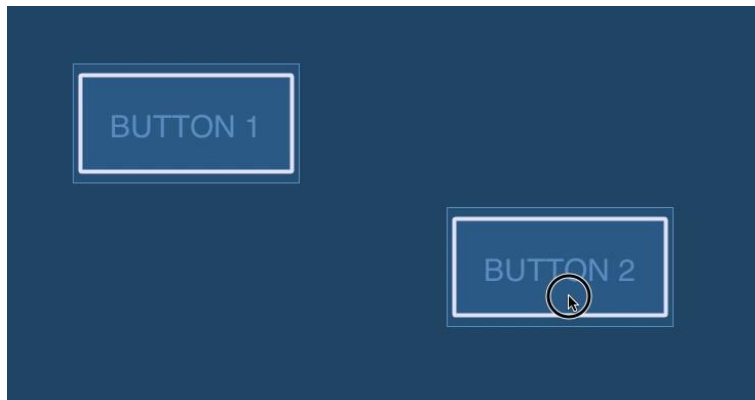
```
<TextView
    android:id="@+id/tv_2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"/>
```

```
<TextView
    android:id="@+id/tv_1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginEnd="24dp"
    app:layout_constraintEnd_toEndOf="@+id/tv_2"/>
```

```
<TextView
    android:id="@+id/tv_2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content" />
```

ConstraintLayout

Align Baseline a b

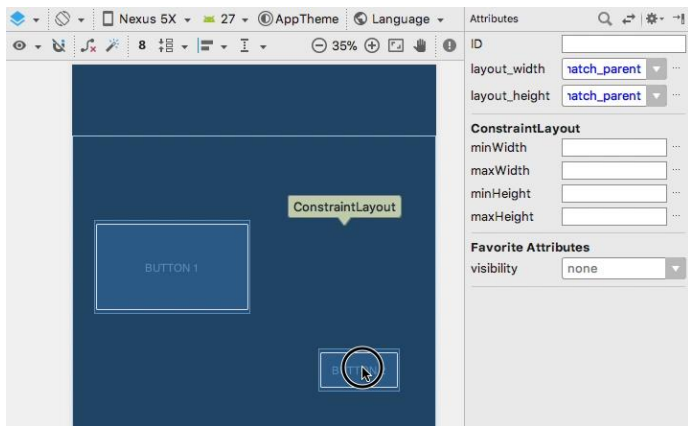


```
<TextView
    android:id="@+id/tv_1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"/>

<TextView
    android:id="@+id/tv_2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    app:layout_constraintBaseline_toBaselineOf="@+id/tv_1"/>
```

ConstraintLayout

Align vertical centers



```
<Button
    android:id="@+id/bt_1"
    android:layout_width="150dp"
    android:layout_height="100dp"
    android:text="Button 1"/>

<Button
    android:id="@+id/bt_2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Button 2"
    app:layout_constraintBottom_toBottomOf="@+id/bt_1"
    app:layout_constraintTop_toTopOf="@+id/bt_1" />
```

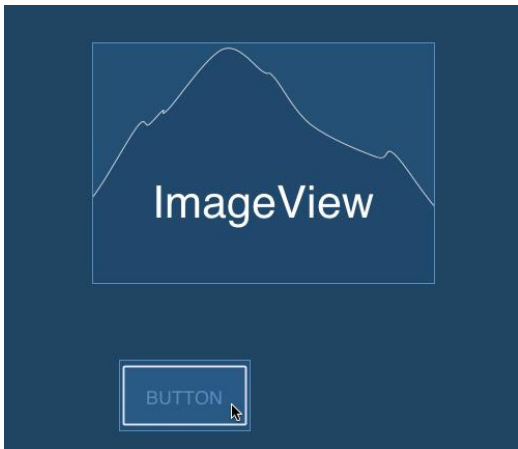


```
<ImageView
    android:id="@+id/imageView"
    android:layout_width="300dp"
    android:layout_height="200dp"/>

<Button
    android:id="@+id/button"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Button"
    app:layout_constraintBottom_toBottomOf="@+id/imageView"
    app:layout_constraintTop_toBottomOf="@+id/imageView" />
```

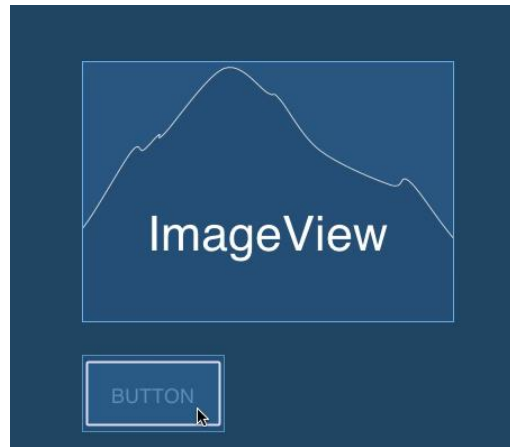
ConstraintLayout

Align horizontal centers



```
<ImageView
    android:id="@+id/imageView"
    android:layout_width="300dp"
    android:layout_height="200dp"/>

<Button
    android:id="@+id/button"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Button"
    app:layout_constraintStart_toStartOf="@+id/imageView"
    app:layout_constraintEnd_toEndOf="@+id/imageView"/>
```



```
<ImageView
    android:id="@+id/imageView"
    android:layout_width="300dp"
    android:layout_height="200dp"/>

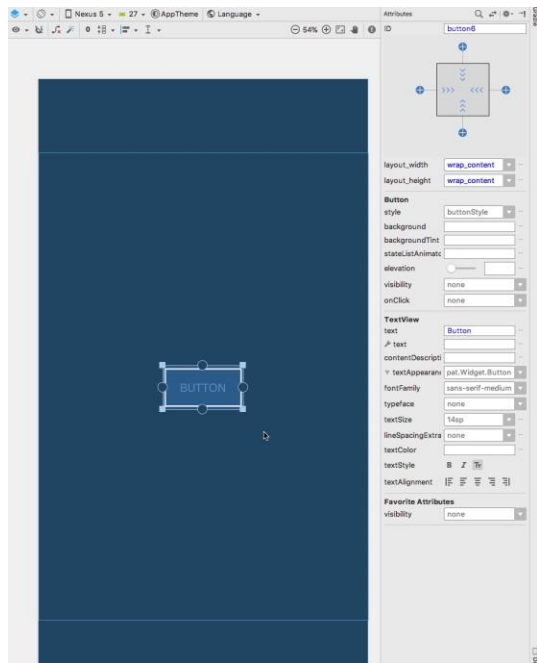
<Button
    android:id="@+id/button"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Button"
    app:layout_constraintStart_toStartOf="@+id/imageView"
    app:layout_constraintEnd_toStartOf="@+id/imageView"/>
```


ConstraintLayout

Center horizontally in parent



Center vertically in parent

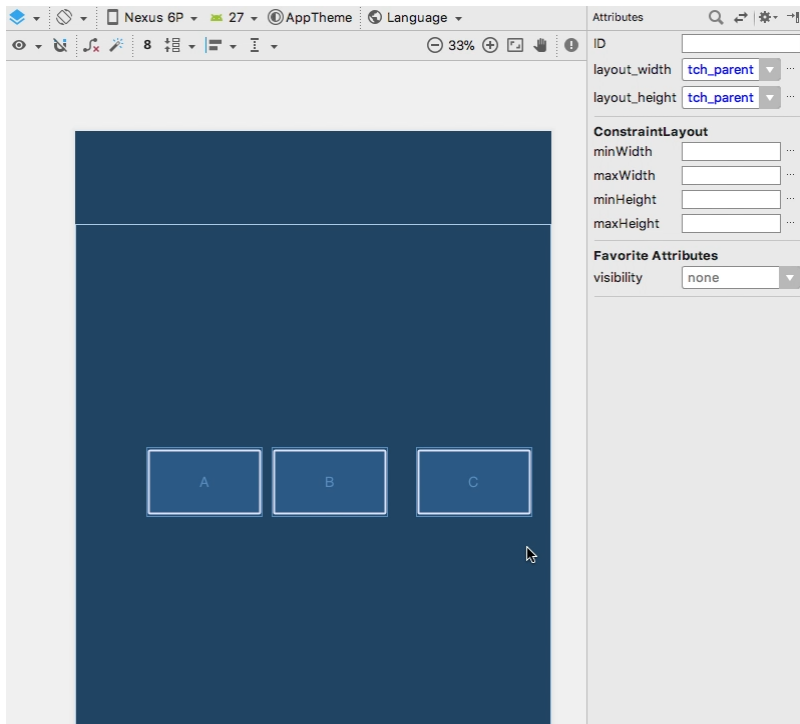


```
<Button
    android:id="@+id/bt"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Button"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintHorizontal_bias="0.5"/>
```

```
<Button
    android:id="@+id/bt"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Button"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintVertical_bias="0.5"/>
```

ConstraintLayout

Horizontal Chain



<Button

```
    android:id="@+id/bt_a"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="A"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintEnd_toStartOf="@+id/bt_b"
    app:layout_constraintHorizontal_chainStyle="spread|spread_inside|packed"/>
```

head

<Button

```
    android:id="@+id/bt_b"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="B"
    app:layout_constraintStart_toEndOf="@+id/bt_a"
    app:layout_constraintEnd_toStartOf="@+id/bt_c"/>
```

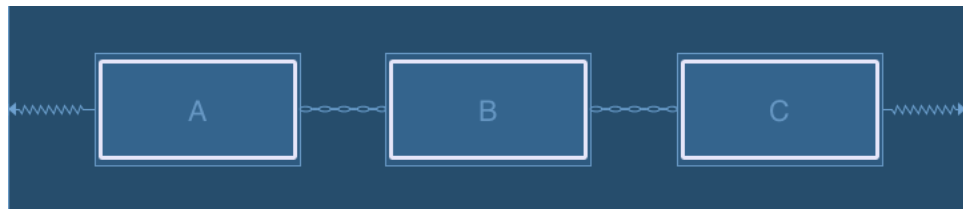
<Button

```
    android:id="@+id/bt_c"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="C"
    app:layout_constraintStart_toEndOf="@+id/bt_b"
    app:layout_constraintEnd_toEndOf="parent"/>
```

ConstraintLayout

Horizontal Chain

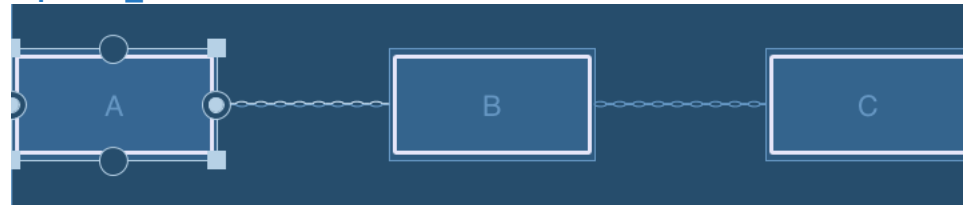
spread



```
<Button
    android:id="@+id/bt_a"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="A"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintEnd_toStartOf="@+id/bt_b"
    app:layout_constraintHorizontal_chainStyle="spread"/>
```

head

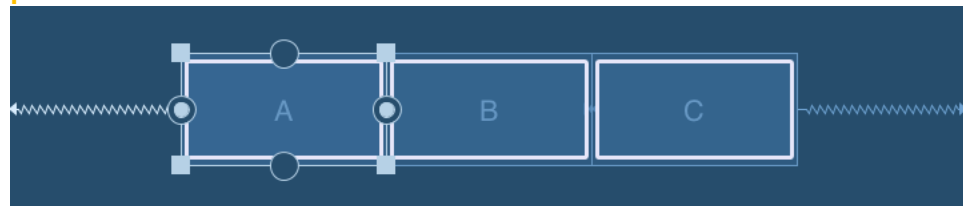
spread_inside



```
<Button
    android:id="@+id/bt_a"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="A"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintEnd_toStartOf="@+id/bt_b"
    app:layout_constraintHorizontal_chainStyle="spread_inside"/>
```

head

packed

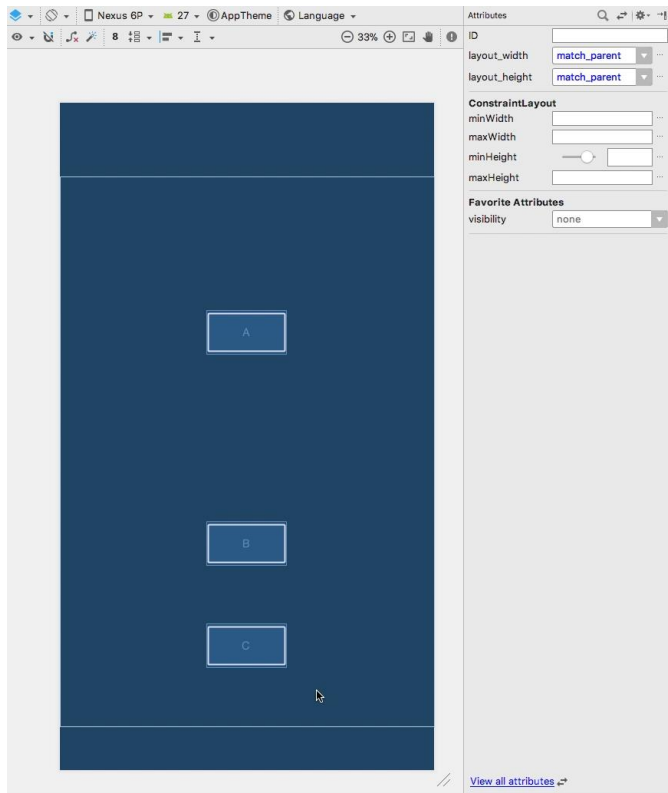


```
<Button
    android:id="@+id/bt_a"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="A"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintEnd_toStartOf="@+id/bt_b"
    app:layout_constraintHorizontal_chainStyle="packed"/>
```

head

ConstraintLayout

Vertical Chain



<Button

```
    android:id="@+id/bt_a"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="A"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintBottom_toTopOf="@+id/bt_b"
    app:layout_constraintVertical_chainStyle="spread|spread_inside|packed"/>
```

head

<Button

```
    android:id="@+id/bt_b"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="B"
    app:layout_constraintTop_toBottomOf="@+id/bt_a"
    app:layout_constraintBottom_toTopOf="@+id/bt_c"/>
```

<Button

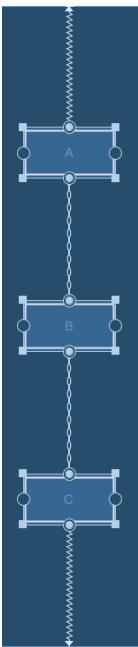
```
    android:id="@+id/bt_c"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="C"
    app:layout_constraintTop_toBottomOf="@+id/bt_b"
    app:layout_constraintBottom_toBottomOf="parent"/>
```

ConstraintLayout

Vertical Chain

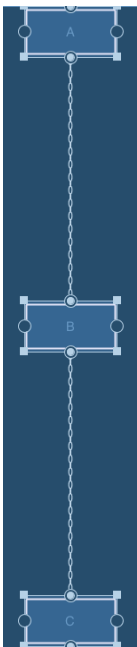
1

spread



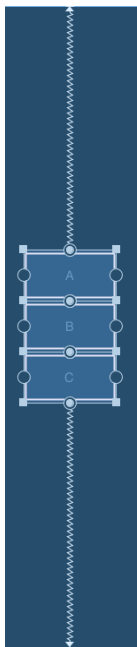
2

spread_inside



3

packed



1
spread

2
spread_inside

3
packed

```
<Button
    android:id="@+id/bt_a"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="A"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintBottom_toTopOf="@+id/bt_b"
    app:layout_constraintVertical_chainStyle="spread"/>
```

head

```
<Button
    android:id="@+id/bt_a"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="A"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintBottom_toTopOf="@+id/bt_b"
    app:layout_constraintVertical_chainStyle="spread_inside"/>
```

head

```
<Button
    android:id="@+id/bt_a"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="A"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintBottom_toTopOf="@+id/bt_b"
    app:layout_constraintVertical_chainStyle="packed"/>
```

head

ConstraintLayout

Align circle

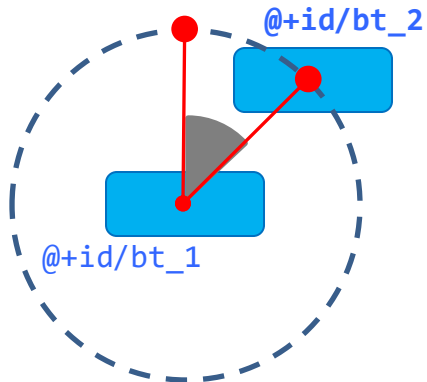
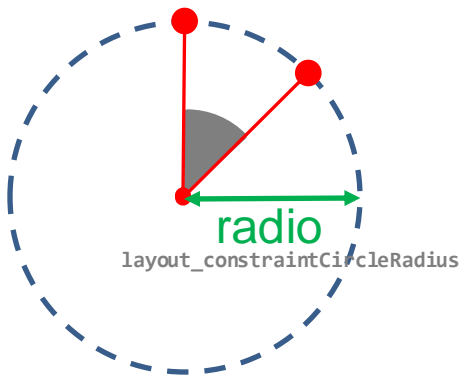


ángulo

layout_constraintCircleAngle

radio

layout_constraintCircleRadius



```
<Button
    android:id="@+id/bt_1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Button 1"
    : : :/>

<Button
    android:id="@+id/bt_2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Button 2"
    app:layout_constraintCircle="@+id/bt_1"
    app:layout_constraintCircleAngle="45"
    app:layout_constraintCircleRadius="100dp"/>
```

ConstraintLayout

Dimensions

~~"match_parent"~~

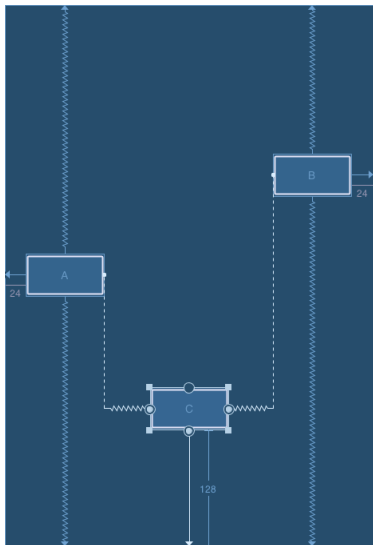
`android:layout_width=` {
 `"XXaa"` \equiv *fixed*
 `"wrap_content"`
 `"0dp"` \equiv *match_constraint*

Button

`android:layout_height=` {
 `"XXaa"` \equiv *fixed*
 `"wrap_content"`
 `"0dp"` \equiv *match_constraint*

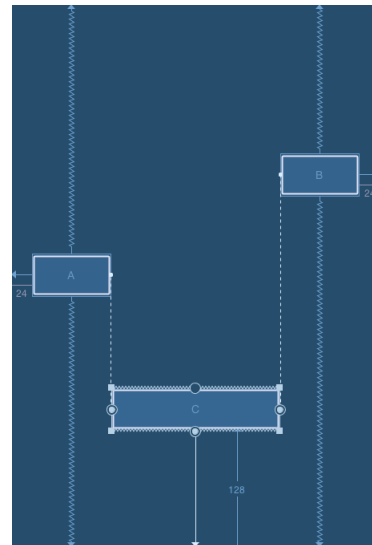
ConstraintLayout

Dimensions



<Button

```
    android:id="@+id/bt_c"  
    android:text="C"  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    app:layout_constraintStart_toEndOf="@+id/bt_a"  
    app:layout_constraintEnd_toStartOf="@+id/bt_b"  
    app:layout_constraintBottom_toBottomOf="parent"  
    android:layout_marginBottom="128dp"/>
```



<Button

```
    android:id="@+id/bt_c"  
    android:text="C"  
    android:layout_width="0dp"  
    android:layout_height="wrap_content"  
    app:layout_constraintStart_toEndOf="@+id/bt_a"  
    app:layout_constraintEnd_toStartOf="@+id/bt_b"  
    app:layout_constraintBottom_toBottomOf="parent"  
    android:layout_marginBottom="128dp"/>
```

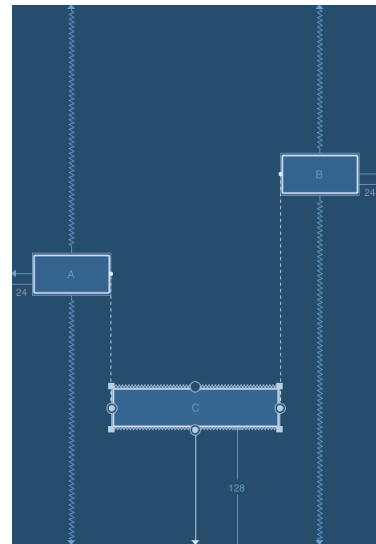

ConstraintLayout

`android:layout_width="0dp"`

`app:layout_constraintWidth_default=` { `"spread"`
`app:layout_constraintHeight_default` { `"wrap"`
 `"percent"`

"spread"

El width de la vista se adapta a los constraints que tiene definidos.



```
<Button
    android:id="@+id/bt_c"
    android:text="C"
    android:layout_width="0dp"
    app:layout_constraintWidth_default="spread"
    android:layout_height="wrap_content"
    app:layout_constraintStart_toEndOf="@+id/bt_a"
    app:layout_constraintEnd_toStartOf="@+id/bt_b"
    app:layout_constraintBottom_toBottomOf="parent"
    android:layout_marginBottom="128dp"/>
```

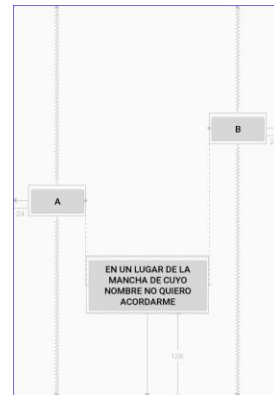
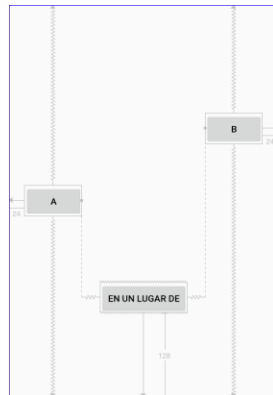
ConstraintLayout

`android:layout_width="0dp"`

`app:layout_constraintWidth_default=` $\begin{cases} \text{"spread"} \\ \text{"wrap"} \\ \text{"percent"} \end{cases}$

"wrap"

El width está condicionado por el contenido de la vista, sin embargo, no puede exceder los límites marcados por los constraints.



```
<Button
    android:id="@+id/bt_c"
    android:text="EN UN LUGAR DE"
    android:layout_width="0dp"
    app:layout_constraintWidth_default="wrap"
    android:layout_height="wrap_content"
    app:layout_constraintStart_toEndOf="@+id/bt_a"
    app:layout_constraintEnd_toStartOf="@+id/bt_b"
    app:layout_constraintBottom_toBottomOf="parent"
    android:layout_marginBottom="128dp"/>
```

```
<Button
    android:id="@+id/bt_c"
    android:text="EN UN LUGAR DE LA MANCA DE CUYO..."
    android:layout_width="0dp"
    app:layout_constraintWidth_default="wrap"
    android:layout_height="wrap_content"
    app:layout_constraintStart_toEndOf="@+id/bt_a"
    app:layout_constraintEnd_toStartOf="@+id/bt_b"
    app:layout_constraintBottom_toBottomOf="parent"
    android:layout_marginBottom="128dp"/>
```

ConstraintLayout

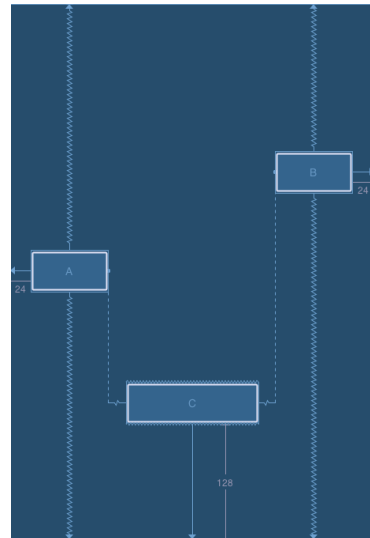
`android:layout_width="0dp"`

`app:layout_constraintWidth_default=` $\begin{cases} \text{"spread"} \\ \text{"wrap"} \\ \text{"percent"} \end{cases}$

Es posible limitar el valor que finalmente alcanzará width fijando un valor mínimo y otro máximo de forma que determinen un rango de posibles valores. Dicho rango se establece mediante:

`app:layout_constraintWidth_min="valor mínimo"`
`app:layout_constraintWidth_max="valor máximo"`

El width resultante podrá exceder los límites fijados por los constraints



```
<Button
    android:id="@+id/bt_c"
    android:text="C"
    android:layout_width="0dp"
    app:layout_constraintWidth_default="wrap"
    app:layout_constraintWidth_min="150dp"
    app:layout_constraintWidth_max="200dp"
    android:layout_height="wrap_content"
    app:layout_constraintStart_toEndOf="@+id/bt_a"
    app:layout_constraintEnd_toStartOf="@+id/bt_b"
    app:layout_constraintBottom_toBottomOf="parent"
    android:layout_marginBottom="128dp"/>
```

ConstraintLayout

`android:layout_width="0dp"`

`app:layout_constraintWidth_default=` $\left\{ \begin{array}{l} \text{"spread"} \\ \text{"wrap"} \\ \text{"percent"} \end{array} \right.$

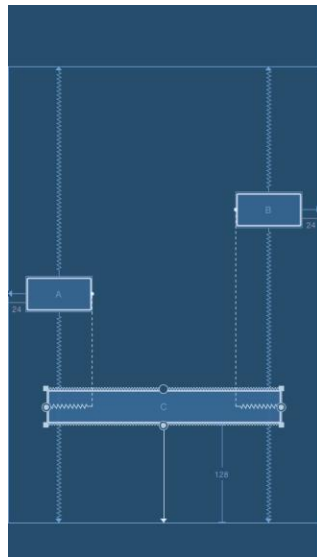
"percent"

El width se determina en función a un porcentaje del tamaño que el *parent* tiene en dicha dimensión. El width resultante puede exceder los límites fijados por los constraints.

Para indicar el porcentaje, se utiliza:

`app:layout_constraintWidth_percent="porcentaje"`

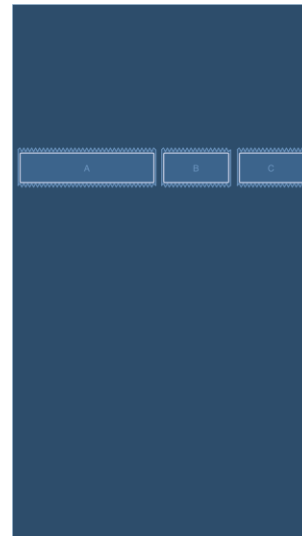
$0 \leq \text{porcentaje} \leq 1$



```
<Button
    android:id="@+id/bt_c"
    android:text="C"
    android:layout_width="0dp"
    app:layout_constraintWidth_default="percent"
    app:layout_constraintWidth_percent="0.75"
    android:layout_height="wrap_content"
    app:layout_constraintStart_toEndOf="@+id/bt_a"
    app:layout_constraintEnd_toStartOf="@+id/bt_b"
    app:layout_constraintBottom_toBottomOf="parent"
    android:layout_marginBottom="128dp"/>
```

ConstraintLayout

`android:layout_width="0dp"`



`app:layout_constraintHorizontal_weight` horizontal chain
`app:layout_constraintVertical_weight` vertical chain

Añade al tamaño de las vistas de un *chain* (horizontal o vertical) el espacio sobrante.

```
<Button
    android:id="@+id/bt_a"
    android:text="A"
    android:layout_height="wrap_content"
    android:layout_width="0dp"
    app:layout_constraintHorizontal_weight="50"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintEnd_toStartOf="@+id/bt_b"
    app:layout_constraintHorizontal_chainStyle="packed"
/>
```

```
<Button
    android:id="@+id/bt_b"
    android:text="B"
    android:layout_height="wrap_content"
    android:layout_width="0dp"
    app:layout_constraintHorizontal_weight="25"
    app:layout_constraintStart_toEndOf="@+id/bt_a"
    app:layout_constraintEnd_toStartOf="@+id/bt_c"
/>
```

```
<Button
    android:id="@+id/bt_c"
    android:text="C"
    android:layout_height="wrap_content"
    android:layout_width="0dp"
    app:layout_constraintHorizontal_weight="25"
    app:layout_constraintStart_toEndOf="@+id/bt_b"
    app:layout_constraintEnd_toEndOf="parent"
/>
```

ConstraintLayout

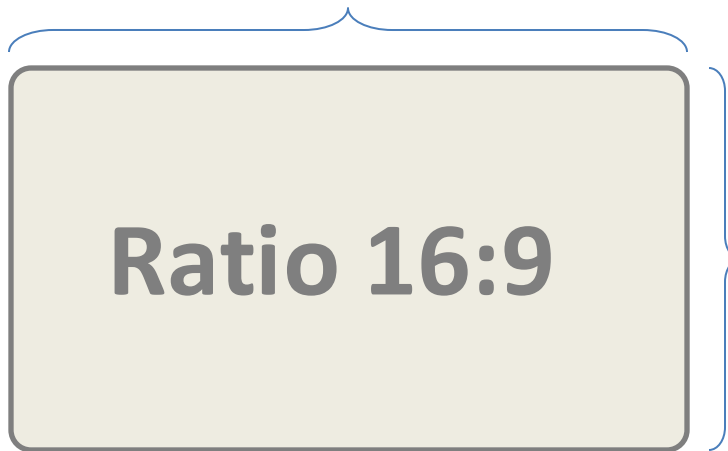
Dimensions · ratio



ConstraintLayout

Dimensions · ratio

`app:layout_constraintWidth="0dp"`



`app:layout_constraintHeight="90dp"`

`app:layout_constraintDimensionRatio="w,16:9"`

ConstraintLayout

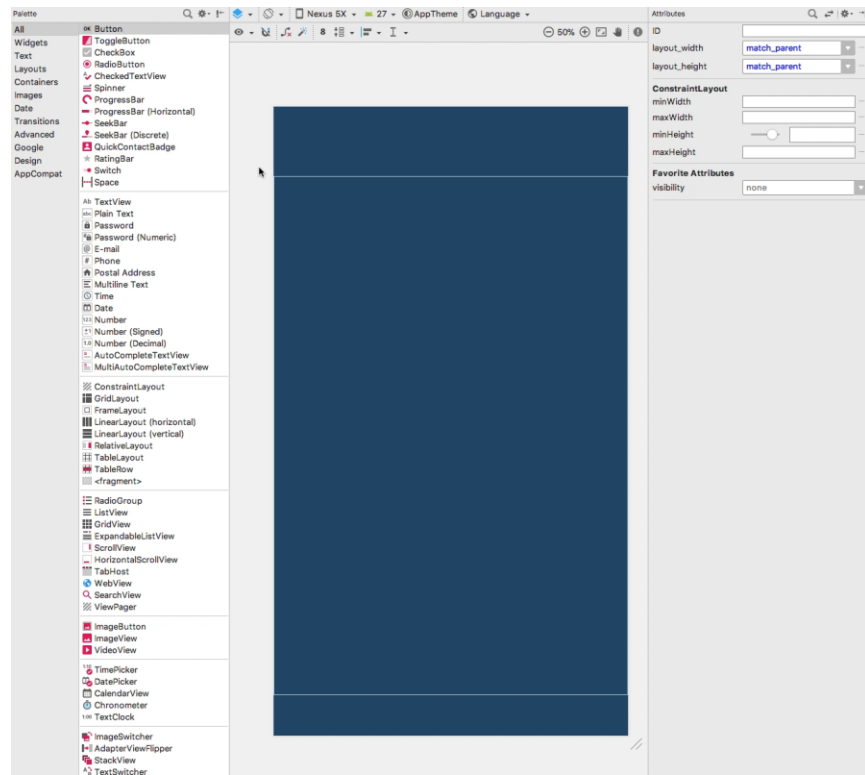
Dimensions - ratio

`app:layout_constraintWidth="160dp"`

`app:layout_constraintHeight="0dp"`

`app:layout_constraintDimensionRatio="h,16:9"`

Ratio 16:9



ConstraintLayout

Guidelines

