

A Coordinate Discretization

In this work, element coordinates are scaled proportionally into a canvas of size $C_W \times C_H$. We follow the baselines to choose these two parameters. Specifically, in RICO, $C_W = 90\text{px}$, $C_H = 160\text{px}$. In PubLayoutNet, $C_W = 120\text{px}$, $C_H = 160\text{px}$. In PosterLayout, $C_W = 102\text{px}$, $C_H = 150\text{px}$. In WebUI, $C_W = 120\text{px}$, $C_H = 120\text{px}$. Then, the coordinates are discretized to the nearest integers.

B Additional Experimental Results and Analysis

B.1 Stability of Generation Performance

The output of LLMs varies with the random seed and hyper-parameters (e.g., the temperature). That is, for the same input constraint, LLMs are able to generate many completely different layouts. Since the hyper-parameters are a trade-off between generation quality and diversity, we fix them to the default values of OpenAI API and study the impact of random seeds on model performance. Specifically, we run inference on the test set 10 times, each using a different random seed. Then, we calculate the mean and variance of each quantitative metric (see Table 8). The small variances indicate the stability of LayoutPrompter’s performance under different random seeds.

Tasks	RICO					PubLayoutNet				
	mIoU ↑	FID ↓	Align. ↓	Overlap ↓	Vio. % ↓	mIoU ↑	FID ↓	Align. ↓	Overlap ↓	Vio. % ↓
Gen-T	0.368±0.002	3.118±0.045	0.130±0.010	0.498±0.004	0.546±0.148	0.343±0.001	4.014±0.067	0.042±0.007	0.047±0.002	0.490±0.059
Gen-TS	0.504±0.001	1.489±0.037	0.155±0.003	0.550±0.005	0.134±0.025	0.393±0.001	2.016±0.024	0.050±0.008	0.098±0.002	0.

Table 8: Effect of random seeds. In this experiment, we disable the layout ranker to eliminate the impact of the ranking mechanism on model performance.

B.2 Effect of Exemplar Number

We conduct ablation experiments on the number of prompting exemplars. Figure 7 shows the zero-shot ($N = 0$) qualitative results on Gen-T. It is obvious that LLMs fail to generate reasonable layouts in a zero-shot scheme. Table 9 exhibits the quantitative comparison of the Gen-T task on RICO. The results indicate that the number of prompting exemplars mainly affects mIoU and FID. Specifically, as the number of prompting exemplars increases, mIoU and FID get improved. In summary, the number of exemplars has a positive effect on the performance of LayoutPrompter.

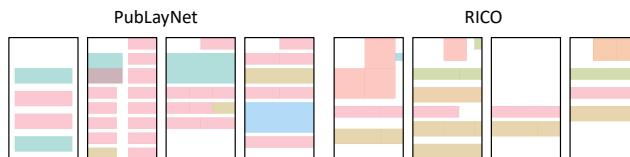


Figure 7: Zero-shot results on the Gen-T task.

Tasks	# exemplar	RICO				
		mIoU ↑	FID ↓	Align. ↓	Overlap ↓	Vio. % ↓
Gen-T	1	0.381	5.007	0.115	0.491	0.85
	3	0.413	5.098	0.120	0.492	0.51
	5	0.414	4.521	0.114	0.492	0.65
	10	0.427	3.523	0.092	0.486	0.67

Table 9: Ablation studies on the number of prompting exemplars. We run experiments on 1,000 test samples.

B.3 Generalization Ability

To investigate the generalization ability of LayoutPrompter, we compute the DocSim similarity between the generated layouts and their prompting layouts (see Table 10). The DocSim of LayoutFormer++ is computed between the generated layouts and training layouts. The quantitative results show that LayoutPrompter achieves competitive or even better scores compared to LayoutFormer++,

indicating that LayoutPrompter has a close generalization ability to the training-based method. In addition, we exhibit the qualitative results of the generated layouts and their prompting layouts in Figure 8. The results demonstrate that LayoutPrompter is capable of generating meaningful variations different from the prompting ones.

Method	RICO	PubLayNet
LayoutFormer++	0.8472	0.8266
LayoutPrompter	0.8563	0.8119

Table 10: DocSim on Gen-T task. The smaller the DocSim, the better the generalization ability.

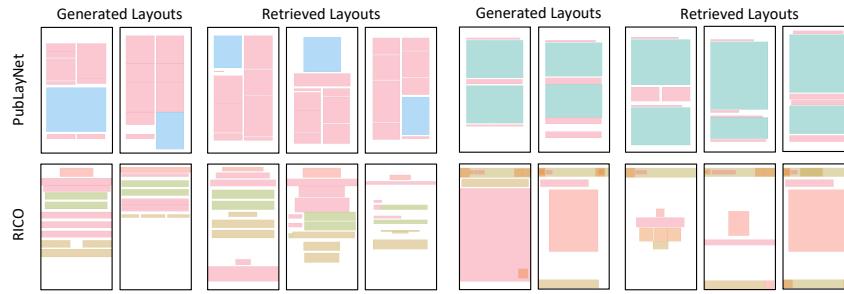
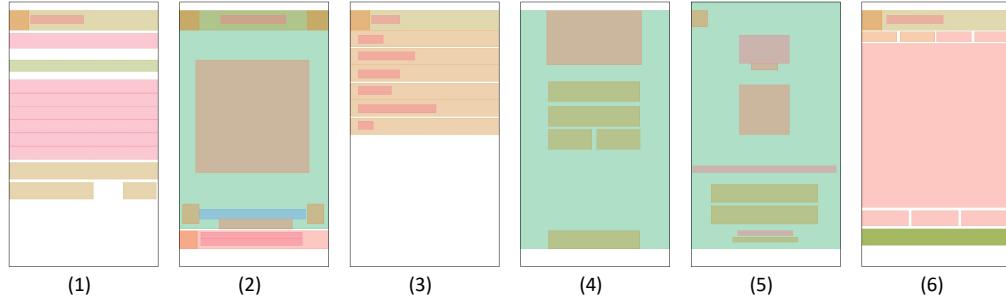


Figure 8: Qualitative results of the generated layouts and corresponding retrieved layouts on Gen-T task. Each case contains 2 generated layouts.

C Additional Qualitative Results

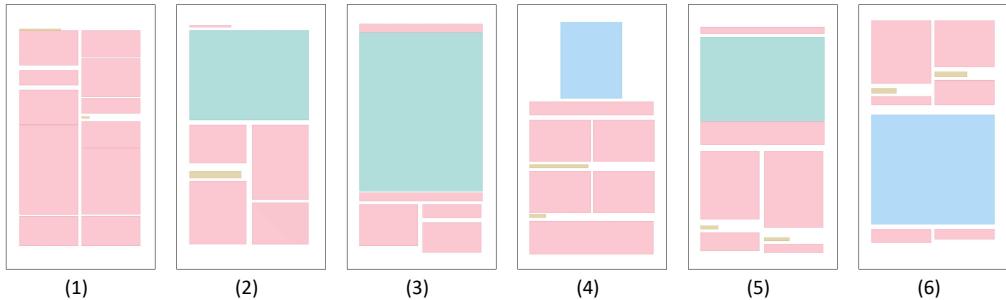
In this section, we present additional qualitative results of LayoutPrompter. These results further demonstrate the versatility and effectiveness of our method, which can generate high-quality and constraint-compliant layouts on multiple layout generation tasks.

C.1 Generation Conditioned on Element Types



Element Type Constraints	
(1)	icon, input, text*8, text button*3, toolbar
(2)	background image, icon*5, image*3, slider, text*3, toolbar
(3)	icon, list item*6, text*7, toolbar
(4)	background image, image, text button*5
(5)	background image, icon, image*2, text*3, text button*3
(6)	advertisement, icon*3, image*6, text, toolbar, web view*2

(a) RICO

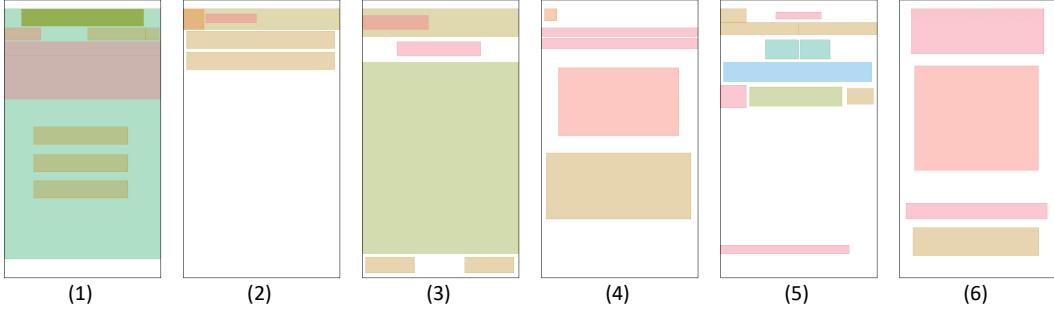


Element Type Constraints	
(1)	text*11, title*2
(2)	table, text*5, title
(3)	table, text*5
(4)	figure, text*6, title*2
(5)	table, text*6, title*2
(6)	figure, text*6, title*2

(b) PubLayoutNet

Figure 9: Qualitative results of Gen-T on RICO and PubLayoutNet. The element type constraints are in the table.

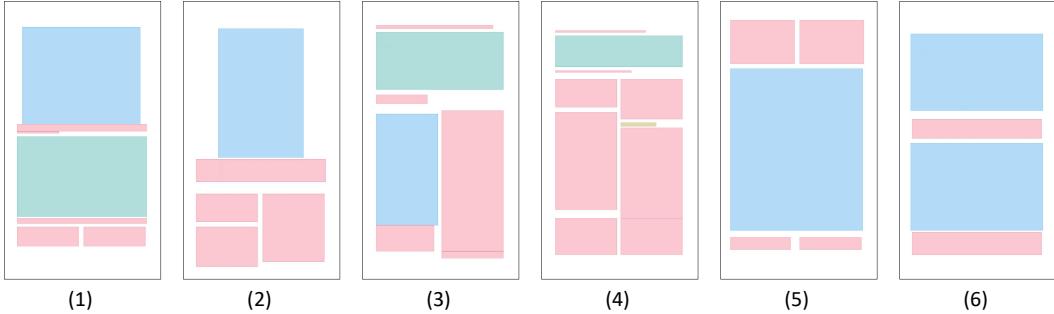
C.2 Generation Conditioned on Element Types and Sizes



Element Type and Size Constraints

- (1) advertisement 70 10, background image 90 144, image 21 7, text 90 25, text 90 8, text button 54 10, text button 54 10, text button 8 7, text button 33 7, text button 54 10, web view 70 10, web view 70 10
- (2) icon 12 12, text 29 5, text button 85 10, text button 85 10, toolbar 90 12
- (3) input 90 110, text 48 8, text 38 8, text button 28 9, text button 28 9, toolbar 90 16
- (4) icon 7 7, image 69 39, text 90 5, text 90 6, text button 83 38
- (5) input 53 11, on/off switch 85 11, radio button 17 11, radio button 19 11, text 15 13, text 74 5, text 26 4, text button 15 9, text button 15 8, text button 45 7, text button 45 7
- (6) image 71 60, text 81 9, text 76 26, text button 72 16

(a) RICO



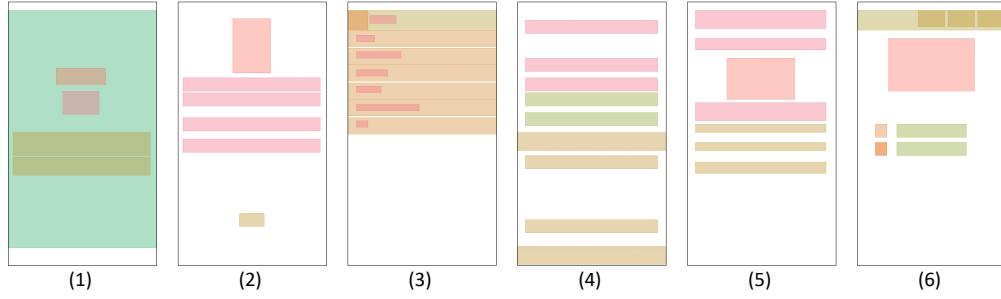
Element Type and Size Constraints

- (1) figure 90 56, table 99 46, text 99 4, text 32 1, text 99 3, text 47 11, text 47 11
- (2) figure 65 74, text 99 13, text 47 16, text 47 39, text 47 23
- (3) figure 47 64, table 97 33, text 89 2, text 39 5, text 47 81, text 44 15, text 47 4
- (4) table 97 18, text 69 1, text 58 1, text 47 23, text 47 16, text 47 56, text 47 52, text 47 21, text 47 21, title 27 2
- (5) figure 101 93, text 49 25, text 49 25, text 46 7, text 47 7
- (6) figure 101 44, figure 101 50, text 99 11, text 99 13

(b) PubLayNet

Figure 10: Qualitative results of Gen-TS on RICO and PubLayNet. The element type and size constraints are in the table.

C.3 Generation Conditioned on Element Relationships



(a) RICO



(b) PubLayoutNet

Figure 11: Qualitative results of Gen-R on RICO and PubLayoutNet. The element relationship constraints are in the table.

C.4 Layout Completion

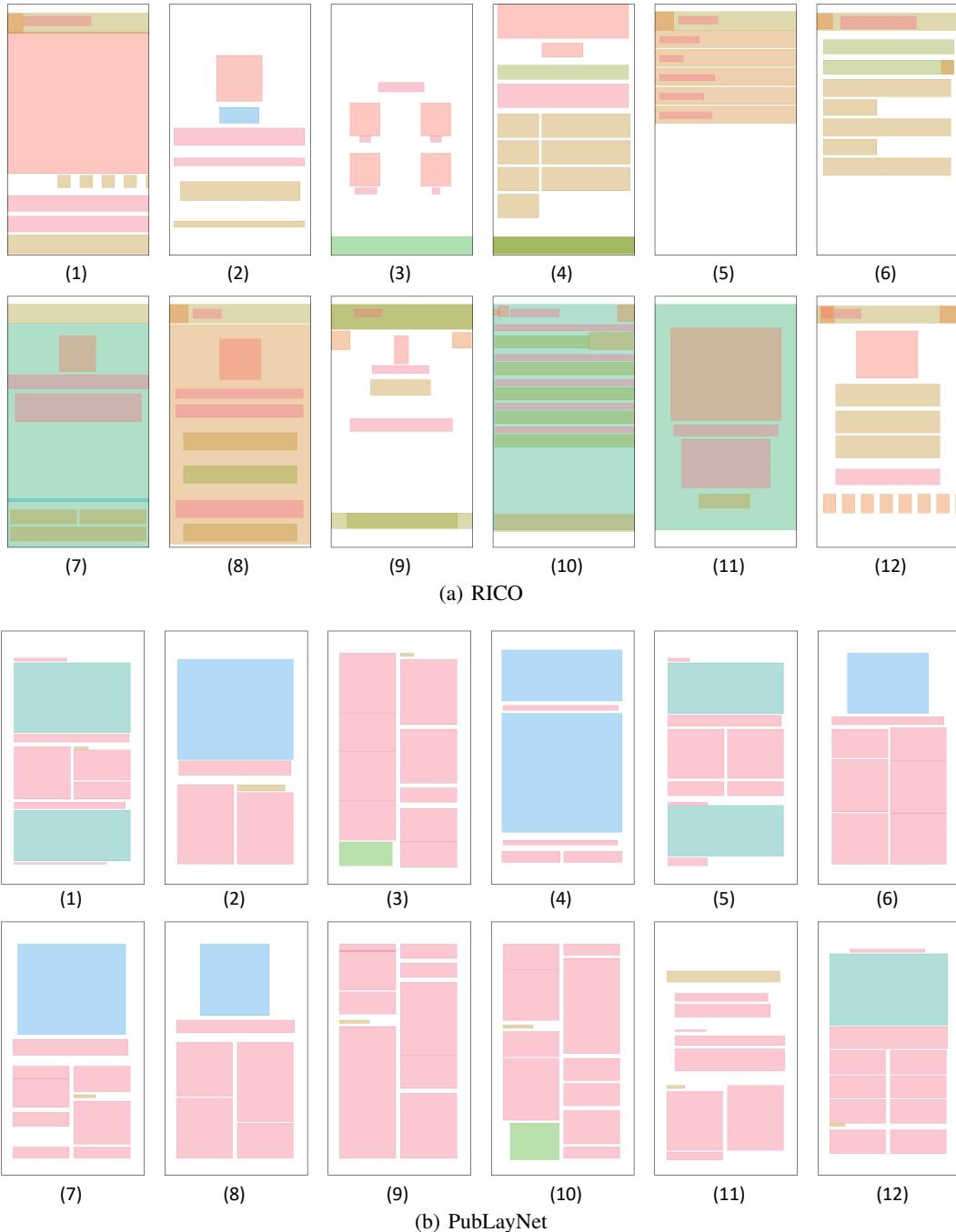


Figure 12: Qualitative results of completion on RICO and PubLayoutNet.

C.5 Layout Refinement



Figure 13: Qualitative results of refinement on RICO and PubLayNet. Note that each group has two layouts. The left one is the noisy layout, and the right one is the refined layout.

C.6 Content-Aware Layout Generation

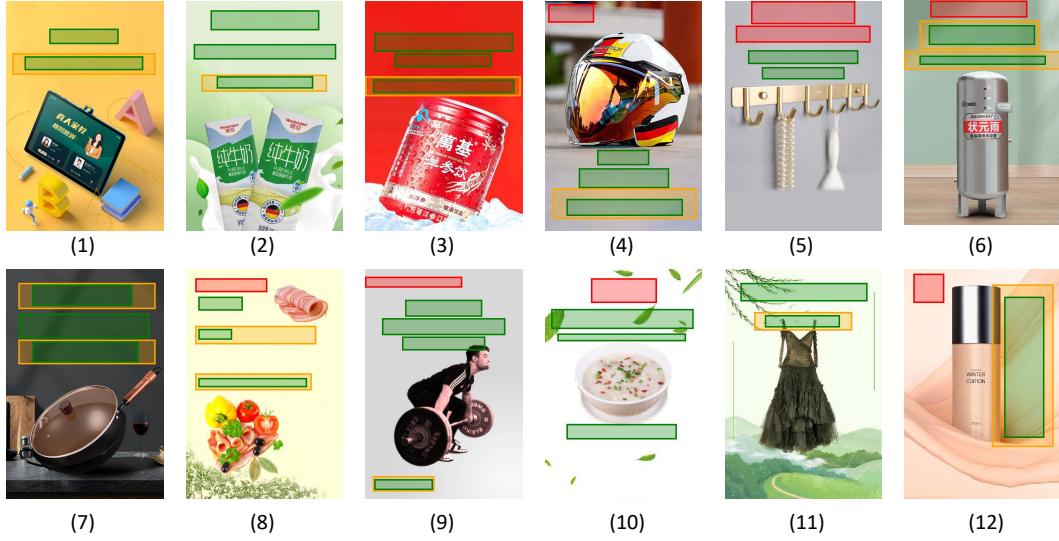
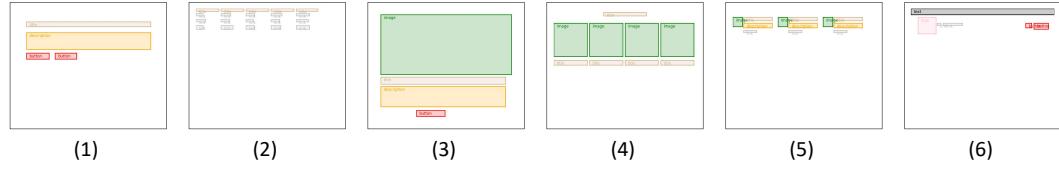


Figure 14: Qualitative results of content-aware layout generation on PosterLayout.

C.7 Text-to-Layout



Textual Descriptions

- (1) A page to file an insurance claim. There should be two text boxes. One is for the title 'Need to file an insurance claim' and the other is a short description. Two buttons are necessary to click to file or manage the claim.
- (2) A footer page showing the homepage of a company. There should be five entries of text links. And the text links should be unfolded. Users can get access to different info through these links.
- (3) A page to introduce an online editor. The page should contain an image, and the slogan "Online Infographics, Diagrams, & Charts Maker" to have a brief introduction, and a further description of the specific service of the editor. Then a button is needed for the user to click to learn info.
- (4) A page for introducing the home tours. The page should have a title, "home tours". Also, there are four groups and each group has an image and a title.
- (5) A page for introducing the service provided by a website. The page should have three groups of information sets: "Web Development" "Social Media", and "Link Building". Each group should include a small image, a title, a further introduction, and a link "READ MORE" for more info by clicking it.
- (6) A header page for navigation of an online shop. The page should have an announcement to explain the product is out of stock, a logo, and two links "HOME" and "BUY DITTO HANGERS" for the user to return to the homepage and view products to shop. Also, two buttons for search and shopping cart are needed.

Figure 15: Qualitative results of text-to-layout on WebUI. The textual descriptions are in the table.

D Prompt Examples

Here, we show a prompt example for each layout generation task, including Gen-T (Table 11), Gen-TS (Table 12), Gen-R (Table 13), completion (Table 14), refinement (Table 15), content-aware layout generation (Table 16), and text-to-layout (Table 17).

Preamble

Please generate a layout based on the given information.

Task Description: generation conditioned on given element types

Layout Domain: android layout

Canvas Size: canvas width is 90px, canvas height is 160px

Exemplar 1

Element Type Constraint: image | image | image | image | text | text button

```
<html>
<body>
<div class="image" style="left:15px; top:42px; width:51px; height:82px"></div>
<div class="image" style="left:52px; top:77px; width:22px; height:50px"></div>
<div class="image" style="left:54px; top:96px; width:18px; height:14px"></div>
<div class="image" style="left:0px; top:143px; width:90px; height:1px"></div>
<div class="text" style="left:34px; top:15px; width:21px; height:7px"></div>
<div class="text" style="left:22px; top:22px; width:44px; height:9px"></div>
<div class="text button" style="left:2px; top:147px; width:41px; height:10px"></div>
</body>
</html>
```

Exemplar 2

Element Type Constraint: image | image | image | image | pager indicator | text | text | text button | text button | text button

```
<html>
<body>
<div class="image" style="left:0px; top:5px; width:90px; height:93px"></div>
<div class="image" style="left:30px; top:8px; width:29px; height:10px"></div>
<div class="image" style="left:38px; top:86px; width:12px; height:12px"></div>
<div class="image" style="left:32px; top:86px; width:24px; height:12px"></div>
<div class="pager indicator" style="left:0px; top:119px; width:90px; height:5px"></div>
<div class="text" style="left:0px; top:98px; width:90px; height:10px"></div>
<div class="text" style="left:0px; top:109px; width:90px; height:9px"></div>
<div class="text button" style="left:0px; top:124px; width:45px; height:10px"></div>
<div class="text button" style="left:45px; top:124px; width:45px; height:10px"></div>
<div class="text button" style="left:0px; top:138px; width:90px; height:11px"></div>
</body>
</html>
```

.....

Test Sample

Element Type Constraint: icon | image | image | text | text | text button | toolbar

(Generated by LLMs)

Table 11: A prompt example of Gen-T on RICO.

Preamble

Please generate a layout based on the given information.

Task Description: generation conditioned on given element types and sizes

Layout Domain: android layout

Canvas Size: canvas width is 90px, canvas height is 160px

Exemplar 1

Element Type and Size Constraint: icon 12 12 | image 0 0 | input 81 10 | input 81 10 | text 81 4 | text 22 4 | text button 85 10 | text button 10 4 | toolbar 90 12

```
<html>
<body>
<div class="icon" style="left:0px; top:5px; width:12px; height:12px"></div>
<div class="image" style="left:12px; top:11px; width:0px; height:0px"></div>
<div class="input" style="left:4px; top:40px; width:81px; height:10px"></div>
<div class="input" style="left:4px; top:28px; width:81px; height:10px"></div>
<div class="text" style="left:4px; top:23px; width:81px; height:4px"></div>
<div class="text" style="left:13px; top:9px; width:22px; height:4px"></div>
<div class="text button" style="left:2px; top:62px; width:85px; height:10px"></div>
<div class="text button" style="left:75px; top:43px; width:10px; height:4px"></div>
<div class="toolbar" style="left:0px; top:5px; width:90px; height:12px"></div>
</body>
</html>
```

Exemplar 2

Element Type and Size Constraint: card 86 41 | icon 12 12 | input 64 12 | input 78 12 | input 78 9 | input 61 9 | text 15 5 | text button 25 7 | text button 13 7 | text button 62 3 | toolbar 90 12

```
<html>
<body>
<div class="card" style="left:1px; top:19px; width:86px; height:41px"></div>
<div class="icon" style="left:0px; top:5px; width:12px; height:12px"></div>
<div class="input" style="left:5px; top:36px; width:64px; height:12px"></div>
<div class="input" style="left:5px; top:23px; width:78px; height:12px"></div>
<div class="input" style="left:5px; top:23px; width:78px; height:9px"></div>
<div class="input" style="left:5px; top:36px; width:61px; height:9px"></div>
<div class="text" style="left:15px; top:8px; width:15px; height:5px"></div>
<div class="text button" style="left:60px; top:51px; width:25px; height:7px"></div>
<div class="text button" style="left:70px; top:38px; width:13px; height:7px"></div>
<div class="text button" style="left:13px; top:62px; width:62px; height:3px"></div>
<div class="toolbar" style="left:0px; top:5px; width:90px; height:12px"></div>
</body>
</html>
```

.....

Test Sample

Element Type and Size Constraint: icon 12 12 | input 83 9 | input 83 9 | text 83 8 | text button 19 9 | text button 77 5 | toolbar 90 12

(Generated by LLMs)

Table 12: A prompt example of Gen-TS on RICO.

Preamble

Please generate a layout based on the given information.

Task Description: generation conditioned on given element relationships

Layout Domain: android layout

Canvas Size: canvas width is 90px, canvas height is 160px

Exemplar 1

Element Type Constraint: image | image | image | text | text | text | text button | toolbar

Element Relationship Constraint: text 5 bottom canvas | image 1 larger image 0 | text 3 larger image 0 | text 5 larger image 0 | toolbar 8
larger image 0 | image 2 equal image 1 | text 4 smaller image 2 | text 6 smaller image 2 | toolbar 8 top text 4

```
<html>
<body>
<div class="image" style="left:0px; top:7px; width:7px; height:7px"></div>
<div class="image" style="left:31px; top:33px; width:28px; height:29px"></div>
<div class="image" style="left:30px; top:101px; width:28px; height:29px"></div>
<div class="text" style="left:8px; top:8px; width:28px; height:5px"></div>
<div class="text" style="left:24px; top:66px; width:40px; height:5px"></div>
<div class="text" style="left:18px; top:133px; width:52px; height:5px"></div>
<div class="text" style="left:18px; top:140px; width:51px; height:7px"></div>
<div class="text button" style="left:75px; top:5px; width:14px; height:11px"></div>
<div class="toolbar" style="left:0px; top:5px; width:90px; height:11px"></div>
</body>
</html>
```

Exemplar 2

Element Type Constraint: text | text | text | text | text button

Element Relationship Constraint: text 3 bottom text 0 | text 2 equal text 1

```
<html>
<body>
<div class="text" style="left:0px; top:7px; width:90px; height:5px"></div>
<div class="text" style="left:3px; top:19px; width:83px; height:30px"></div>
<div class="text" style="left:3px; top:57px; width:83px; height:30px"></div>
<div class="text" style="left:3px; top:95px; width:83px; height:52px"></div>
<div class="text button" style="left:0px; top:148px; width:90px; height:11px"></div>
</body>
</html>
```

.....

Test Sample

Element Type Constraint: icon | image | text | text | text | text button | text button

Element Relationship Constraint: text 3 top canvas | text 5 top canvas | text 2 right icon 0 | text button 6 bottom icon 0 |
text 3 bottom image 1 | text button 7 bottom text 4

(Generated by LLMs)

Table 13: A prompt example of Gen-R on RICO.

Preamble

Please generate a layout based on the given information.

Task Description: layout completion

Layout Domain: android layout

Canvas Size: canvas width is 90px, canvas height is 160px

Exemplar 1

Partial Layout: image 21 5 47 40

```
<html>
<body>
<div class="image" style="left:21px; top:5px; width:47px; height:40px"></div>
<div class="text button" style="left:2px; top:53px; width:84px; height:15px"></div>
<div class="image" style="left:7px; top:74px; width:9px; height:5px"></div>
<div class="text" style="left:19px; top:74px; width:67px; height:5px"></div>
<div class="text button" style="left:2px; top:85px; width:84px; height:14px"></div>
<div class="text button" style="left:1px; top:104px; width:86px; height:12px"></div>
<div class="text button" style="left:1px; top:136px; width:86px; height:11px"></div>
</body>
</html>
```

Exemplar 2

Partial Layout: image 17 5 56 11

```
<html>
<body>
<div class="image" style="left:17px; top:5px; width:56px; height:11px"></div>
<div class="image" style="left:0px; top:17px; width:90px; height:48px"></div>
<div class="text" style="left:2px; top:65px; width:86px; height:48px"></div>
<div class="image" style="left:0px; top:108px; width:90px; height:5px"></div>
<div class="pager indicator" style="left:38px; top:114px; width:12px; height:8px"></div>
<div class="text button" style="left:3px; top:124px; width:82px; height:13px"></div>
<div class="text button" style="left:62px; top:137px; width:17px; height:10px"></div>
<div class="text" style="left:10px; top:140px; width:51px; height:6px"></div>
</body>
</html>
```

.....

Test Sample

Partial Layout: image 12 10 65 32

(Generated by LLMs)

Table 14: A prompt example of layout completion on RICO.

Preamble

Please generate a layout based on the given information.

Task Description: layout refinement

Layout Domain: android layout

Canvas Size: canvas width is 90px, canvas height is 160px

Exemplar 1

Noise Layout: advertisement 11 18 70 11 | icon 76 5 11 11 | icon 0 6 12 10 | image 16 8 13 11 | text 30 3 21 5 |
text 29 11 23 4 | toolbar 0 5 88 16 | web view 9 16 69 12 | web view 11 17 70 12 | web view 0 20 90 140
<html>
<body>
<div class="advertisement" style="left:10px; top:18px; width:70px; height:11px"></div>
<div class="icon" style="left:77px; top:6px; width:12px; height:11px"></div>
<div class="icon" style="left:0px; top:5px; width:12px; height:13px"></div>
<div class="image" style="left:15px; top:6px; width:14px; height:11px"></div>
<div class="text" style="left:30px; top:6px; width:21px; height:6px"></div>
<div class="text" style="left:30px; top:12px; width:23px; height:5px"></div>
<div class="toolbar" style="left:0px; top:5px; width:90px; height:13px"></div>
<div class="web view" style="left:10px; top:18px; width:70px; height:11px"></div>
<div class="web view" style="left:10px; top:18px; width:70px; height:11px"></div>
<div class="web view" style="left:0px; top:18px; width:90px; height:141px"></div>
</body>
</html>

Exemplar 2

Noise Layout: advertisement 0 4 89 11 | background image 0 4 89 145 | icon 4 17 6 7 | icon 11 19 4 6 | image 1 8 5 5 |
image 0 13 20 10 | text 35 8 18 5 | text button 80 6 7 3 | text button 16 14 64 8 | text button 82 14 9 7 |
text button 10 29 68 11 | text button 0 39 88 12 | web view 10 2 69 12 | web view 9 6 69 10
<html>
<body>
<div class="advertisement" style="left:0px; top:5px; width:90px; height:10px"></div>
<div class="background image" style="left:0px; top:5px; width:90px; height:144px"></div>
<div class="icon" style="left:5px; top:19px; width:4px; height:4px"></div>
<div class="icon" style="left:11px; top:19px; width:4px; height:4px"></div>
<div class="image" style="left:2px; top:7px; width:5px; height:5px"></div>
<div class="image" style="left:0px; top:16px; width:21px; height:7px"></div>
<div class="text" style="left:35px; top:7px; width:18px; height:5px"></div>
<div class="text button" style="left:81px; top:8px; width:6px; height:5px"></div>
<div class="text button" style="left:16px; top:16px; width:63px; height:10px"></div>
<div class="text button" style="left:81px; top:16px; width:8px; height:7px"></div>
<div class="text button" style="left:11px; top:27px; width:68px; height:10px"></div>
<div class="text button" style="left:0px; top:41px; width:90px; height:11px"></div>
<div class="web view" style="left:10px; top:5px; width:70px; height:10px"></div>
<div class="web view" style="left:10px; top:5px; width:70px; height:10px"></div>
</body>
</html>

.....

Test Sample

Noise Layout: icon 68 5 10 12 | icon 1 5 9 12 | icon 80 5 12 13 | text 14 7 56 2 | toolbar 0 5 90 10 |
web view 0 18 90 130 | web view 0 19 90 130

(Generated by LLMs)

Table 15: A prompt example of layout refinement on RICO.

Preamble

Please generate a layout based on the given information.

Task Description: content-aware layout generation

Layout Domain: poster layout

Canvas Size: canvas width is 102px, canvas height is 150px

Exemplar 1

Content Constraint: left 25px, top 25px, width 30px, height 12px

Element Type Constraint: logo | text | underlay | text

```
<html>
<body>
<div class="logo" style="left:34px; top:14px; width:66px; height:23px"></div>
<div class="text" style="left:10px; top:25px; width:94px; height:36px"></div>
<div class="underlay" style="left:18px; top:37px; width:85px; height:48px"></div>
<div class="text" style="left:36px; top:40px; width:64px; height:45px"></div>
<div class="text" style="left:28px; top:48px; width:74px; height:53px"></div>
</body>
</html>
```

Exemplar 2

Content Constraint: left 23px, top 60px, width 56px, height 69px

Element Type Constraint: logo | text | underlay | text

```
<html>
<body>
<div class="logo" style="left:35px; top:0px; width:66px; height:10px"></div>
<div class="text" style="left:15px; top:22px; width:86px; height:33px"></div>
<div class="underlay" style="left:29px; top:37px; width:73px; height:49px"></div>
<div class="text" style="left:35px; top:40px; width:67px; height:47px"></div>
</body>
</html>
```

.....

Test Sample

Content Constraint: left 26px, top 62px, width 50px, height 60px

Element Type Constraint: logo | text | text | text | underlay | text

(Generated by LLMs)

Table 16: A prompt example of content-aware layout generation on PosterLayout.

Preamble

Please generate a layout based on the given information.

Task Description: text-to-layout

Layout Domain: web layout

Canvas Size: canvas width is 120px, canvas height is 120px

Exemplar 1

Text: A header page for the company Fashionably Latellc. On the page, there should include a name of the company, three navigation links "Home" "Our Fashionably Items" and "Return/Refund Policy" for the user to click to return to the homepage, view items of the company, and know the return or refund policy. Besides, it is necessary to have three icons for login, search, and shopping cart.

```
<html>
<body>
<div class="icon" style="left:101px; top:3px; width:2px; height:2px"></div>
<div class="icon" style="left:106px; top:3px; width:2px; height:2px"></div>
<div class="icon" style="left:110px; top:2px; width:5px; height:5px"></div>
<div class="link" style="left:35px; top:3px; width:4px; height:2px"></div>
<div class="link" style="left:42px; top:3px; width:17px; height:2px"></div>
<div class="link" style="left:62px; top:3px; width:16px; height:2px"></div>
<div class="title" style="left:5px; top:3px; width:24px; height:3px"></div>
</body>
</html>
```

Exemplar 2

Text: A header page for a website Png AAA. There should have a logo on the left, and three links "LOG IN" "SIGN UP", and "UPLOAD", so the user can click them to log in, create an account, and upload something.

```
<html>
<body>
<div class="link" style="left:88px; top:2px; width:5px; height:2px"></div>
<div class="link" style="left:97px; top:2px; width:6px; height:2px"></div>
<div class="link" style="left:110px; top:2px; width:6px; height:2px"></div>
<div class="logo" style="left:2px; top:1px; width:15px; height:4px"></div>
</body>
</html>
```

.....

Test Sample

Text: A header page of the website "homment". On the page, there should include a logo of the website. Five links ("Latest", "Top100", "About", "Register", and "Login") a button "Create" and an icon are on the page.
(Generated by LLMs)

Table 17: A prompt example of text-to-layout on WebUI.