Contents

1 Code Formatting

```
  class HelloWorld {
   public static void main(String[] args) {
    System.out.println("Hello World!");
    // Hello World!
   }
 }
 
```

Figure 1: Hello world java program

```
class HelloWorld {
 public static void main(String[] args) {
  System.out.println("Hello World!");
   // Hello World!
  }
}
```

Figure 2: Hello world java program loaded from file

2 Tables

A	B	C
a	b	c
1	2	3

Table 1: Small table

3 Figures and Subfigures

When placing figures or tables (also known as floats), there are a few different options you can specify:

- **h** means *here* → your float should be placed where you wrote it if there is enough space
- **t** means that the float is allowed to go into the *top* area

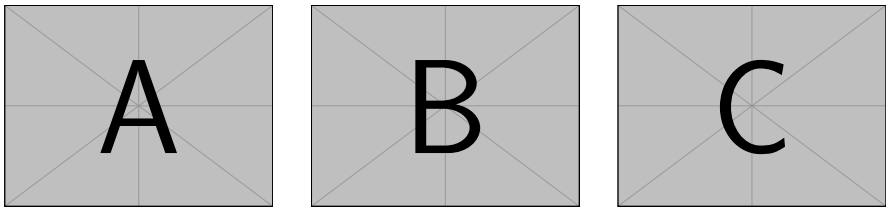
Models	Metric 1			Metric 2
	precision	recall	F-score	R@10
model 1	0.67	0.8	0.729	0.75
model 2	0.8	0.9	0.847	0.85

Table 2: Multiline table taken from this tutorial

- **b** means that the float can go in the *bottom* area
- **p** means that the float should be placed on a page which only contains other floats.

For more information, you can also read this detailed stack exchange reply.

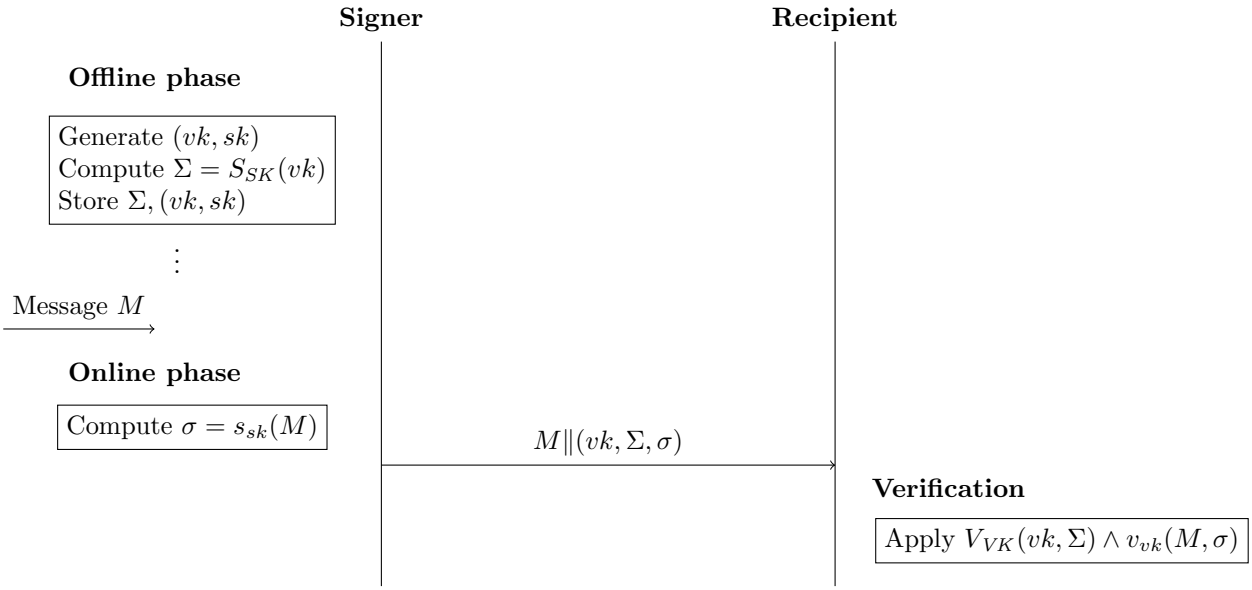
I can refer to a whole figure, e.g. Figure 3 or a subfigure, e.g. Figure 3a.



(a) Figure 1 (b) Figure 2 (c) Figure 3

Figure 3: 3 Figures next to each other

4 TikZ



Example of a sequence diagram drawn with TikZ.

There are many example images for TikZ online. I gave you a few sources under useful links. When you want to draw something with TikZ, it makes sense to look for similar examples and to just modify them. This is what I did for this sequence diagram.

5 Formulas and Matrices

One example for a matrix:

$$\Phi = \begin{bmatrix} \phi_0(x_1) & \dots & \phi_{M-1}(x_1) \\ \vdots & \ddots & \vdots \\ \phi_0(x_N) & \dots & \phi_{M-1}(x_N) \end{bmatrix} = \begin{bmatrix} \phi(x_1)^T \\ \vdots \\ \phi(x_N)^T \end{bmatrix}$$

In LaTeX, there are different ways to display mathematical expressions. Inline equations/mathematical terms appear directly in our text, e.g. $y = y_1, \dots, y_N$.

We can also use display mode which shows the formula in it's own line. Here we have two formulas set in display mode:

The first one is unnumbered:

$$E[\mu_{ML}] = E[\frac{1}{N}\sum_{n=1}^{N} x_n] = \mu$$

We can also add numbering to our formulas:

$$[\sigma^2_{ML}] = E[\frac{1}{2}\sum_{n=1}^{N}(x_n - \mu_{ML})^2] = \frac{N-1}{N}\sigma^2 \tag{1}$$

By using the *aligned* command, we can align multiple formulas underneath each other. We can also use labels to refer to a specific line, e.g. see Equation 1.

$$\begin{aligned} E &= \frac{1}{2}\sum_{n=1}^{N}(t_n - \phi(x_n)^T\mathbf{w})^2 && (1)\\ &= \frac{1}{2}(\mathbf{t} - \mathbf{\Phi w})^T(\mathbf{t} - \mathbf{\Phi w}) && (2)\\ &= \frac{1}{2}(\mathbf{t}^T\mathbf{t} - 2\mathbf{w}^T\mathbf{\Phi}^T\mathbf{t} + \mathbf{w}^T\mathbf{\Phi}^T\mathbf{\Phi w}) && (3)\\ 0 = \nabla_w E &= \mathbf{\Phi}^T\mathbf{\Phi w} - \mathbf{\Phi}^T\mathbf{t} && (4)\\ w &= (\mathbf{\Phi}^T\mathbf{\Phi})^{-1}\mathbf{\Phi}^T\mathbf{t} && (5) \end{aligned}$$

6 Example text with microtype

The microtype setting makes the edges of your text look nice and smooth, see example text below.

Example text:

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

Quisque ullamcorper placerat ipsum. Cras nibh. Morbi vel justo vitae lacus tincidunt ultrices. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. In hac habitasse platea dictumst. Integer tempus convallis augue. Etiam facilisis. Nunc elementum fermentum wisi. Aenean placerat. Ut imperdiet, enim sed gravida sollicitudin, felis odio placerat quam, ac pulvinar elit purus eget enim. Nunc vitae tortor. Proin tempus nibh sit amet nisl. Vivamus quis tortor vitae risus porta vehicula.

7 Useful Links

- Overleaf Tutorial for tables and figures
- Some more information on tables with booktabs
- Another tutorial for tables
- Good source of TikZ examples
- More TikZ examples
- Tutorial for basic TikZ features
- Tutorial for formulas
- Guide on formatting mathematical formulas
- More information on what microtype does for you