LaTeX

and what I can do in it

Dominika Gajdová
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Contents

1 Programming

As a computer science major, I should be able to project any piece of code I find necessary.

1.1 C language

Here is a function for returning the maximum of two values written in good old C:

```
int max(int a, int b){
if (a > b)
   return a;
else if (a == b)
   return printf("equal");
else
   return b;
}
```

If you want to call the function with given parametres, you do it like this:

```
max(10, 20)    -> 20
max(14, 14)    -> equal
```

1.2 Scheme

What about a recursive procedure for calculating the value of factorial in Scheme?

```
(define fac
   (lambda (n)
      (if (= n 0)
         1
         (* n (fac (- n 1))))))
```

If you want to call the function with a given parametre, you do it like this:

```
(fac 4)  -> 24
(fac 5)  -> 120
```

2 Math

Because I study computer science, I have to have some mathematical skills otherwise I would not be able to write a recursive procedure for getting the value of a factorial.

2.1 Analytical geometry

How do I calculate the length of a side of a 2d object if I only know the coordinates? That's easy:

$$|AB| = B - A = \sqrt{(v_1 - u_1)^2 + (v_2 - u_2)^2}$$

A, B are points of the abscissa and v_1, v_2, u_1, u_1, are vectors.
The area of a triangle with vertices at $(x_1, y_1), (x_2, y_2), (x_3, y_3)$ is:

$$= \pm\frac{1}{2}\begin{bmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{bmatrix}$$

$$= \pm y_2(x_1y_2 + y_1x_3 + y_3x_2 - y_2x_3 - y_1x_2 - x_1y_3)$$

2.2 Factorial

Everyone knows that the way to calculate a factorial of a number is to multiply all the descending numbers beginning with the wanted number.
For example:

$$5! = 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 120$$

So the slightly more mathematical way of saying this is:

$$n! = n(n-1)!$$

Math would not be math without another mathematical definiton, right? This is a recursive[1] definition of a factorial:

$$Fac(n) = \begin{cases} 1 & \text{if } n = 0 \\ n \cdot Fac(n-1) & \text{if } n > 1 \end{cases}$$

[1] A recursive procedure is a procedure that is applied within itself when defining it.

3 Images

Inserting images is quite necessarry nowadays. How would a document look with only math and coding? I'm not writing a boring textbook.

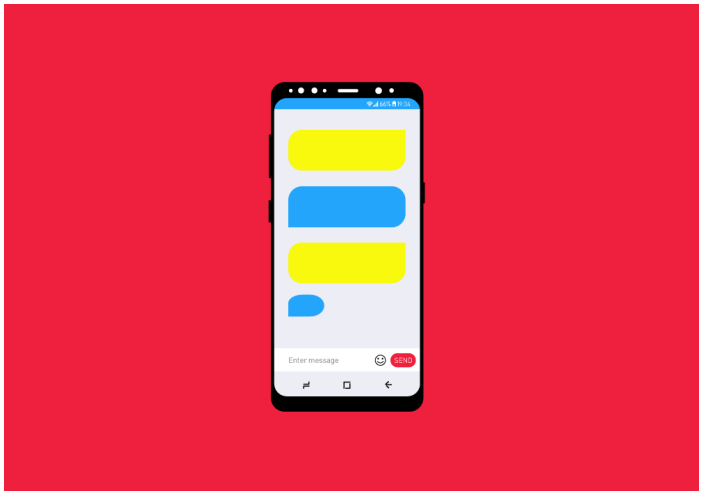

Figure 1: A flat design of Samsung Galaxy 9

Both designs were made in Adobe Illustrator.

Figure 2: A flat design of watches