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## Algorítmica – Práctica 1 – Ejercicio 2 - 2ºD

### 2.- APO:

- Código Fuente:

```
template <class T>
void APO<T>::borrar_minimo(){
    vector[0]=vector[nelementos-1];
    nelementos--;
    if (nelementos>1){
        int ultimo = nelementos-1;
        int pos=0;
        bool acabar = false;
        while (pos<=(ultimo-1)/2 && !acabar){
            int pos_min;
            if (2*pos+1 ==ultimo)
                pos_min= 2*pos+1;
            else if (vector[2*pos+1]
                <vector[2*pos+2])
                pos_min= 2*pos+1;
            else
                pos_min = 2*pos+2;
            if (vector[pos_min]<vector[pos]){
                swap(vector[pos], vector[pos_min]);
                pos=pos_min;
            } else acabar = true;
        }
    }
    if (nelementos<reservados /4) resize(reservados/2);
}
```

- Hardware:

Procesador: Intel® Core™ i5-3350P CPU @ 3.10GHz × 4  
Memoria RAM: 8GB

- Sistema Operativo:

Ubuntu 14.04

- Compilador Utilizado:

g++ -std=c++11

a) Caso Mejor:

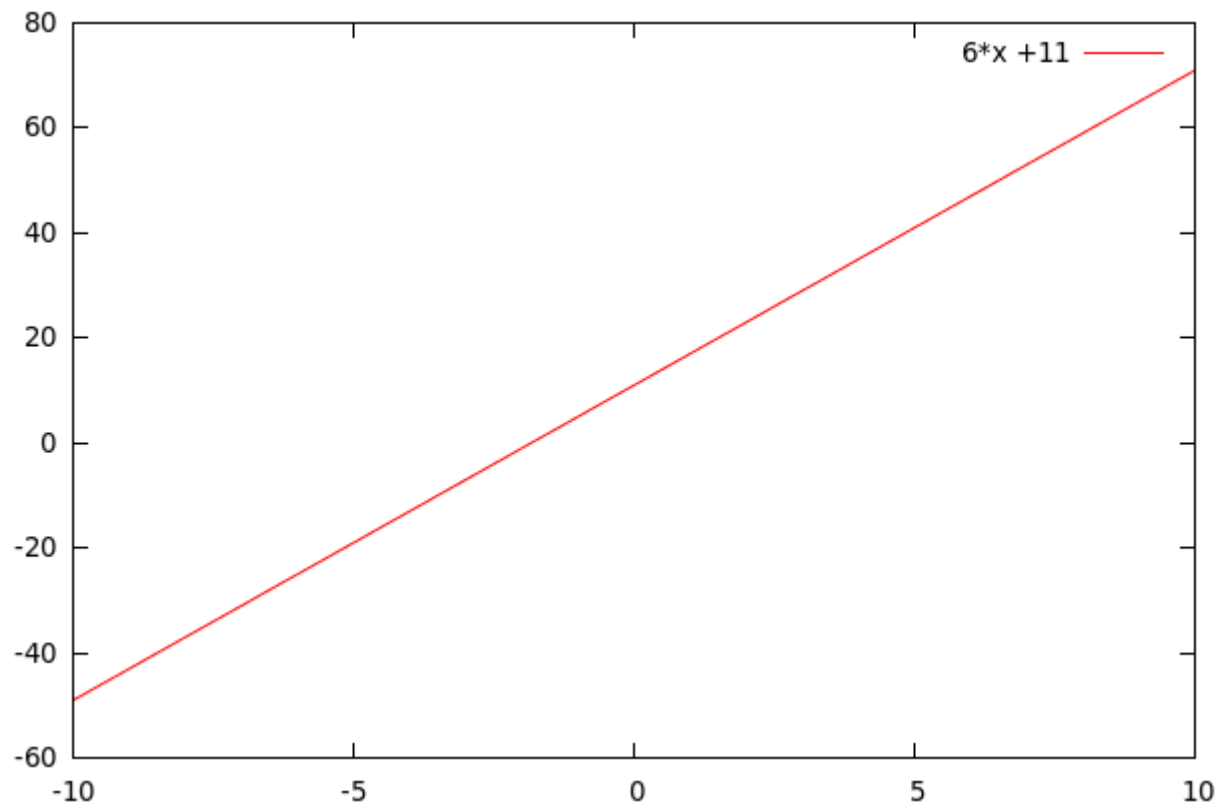
- Eficiencia Teórica:

$$T_m(n) = 4 + 1 + 3 + \sum_{i=0}^n (3 + 2 + 1) + 3$$

$$= +n + 11$$

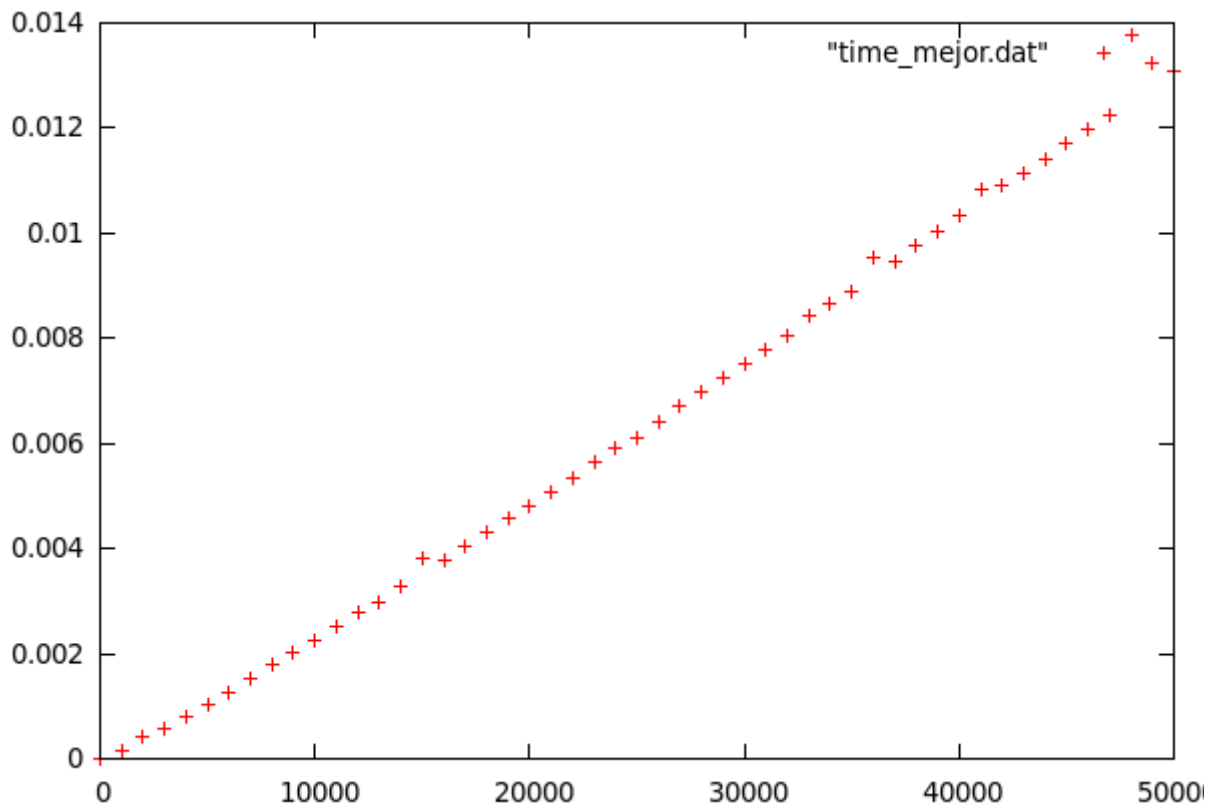
$$f(x) = 6 \cdot x + 11$$

plot f(x)



- Eficiencia empírica:

plot "time\_mejor.dat"

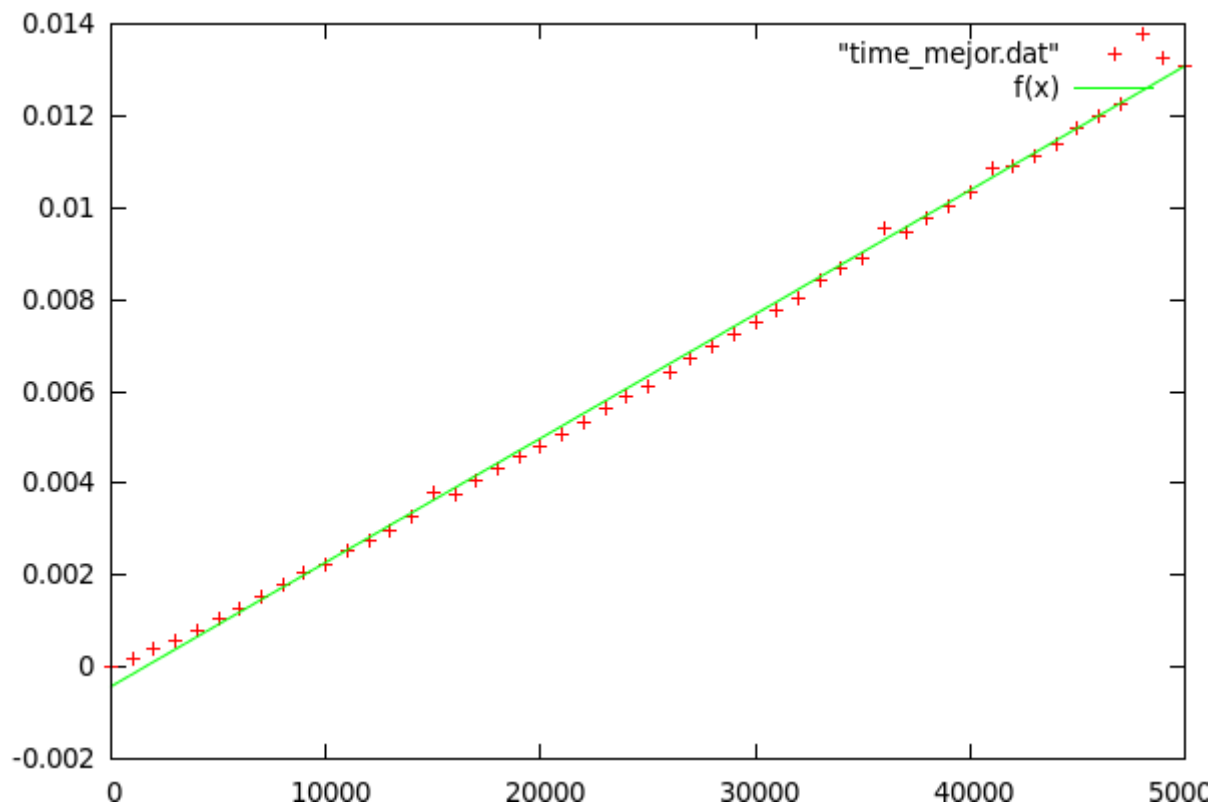


- Ajuste:

$$f(x) = a \cdot x + b$$

fit  $f(x)$  "time\_mejor.dat" via  $a, b$

plot "time\_mejor.dat",  $f(x)$



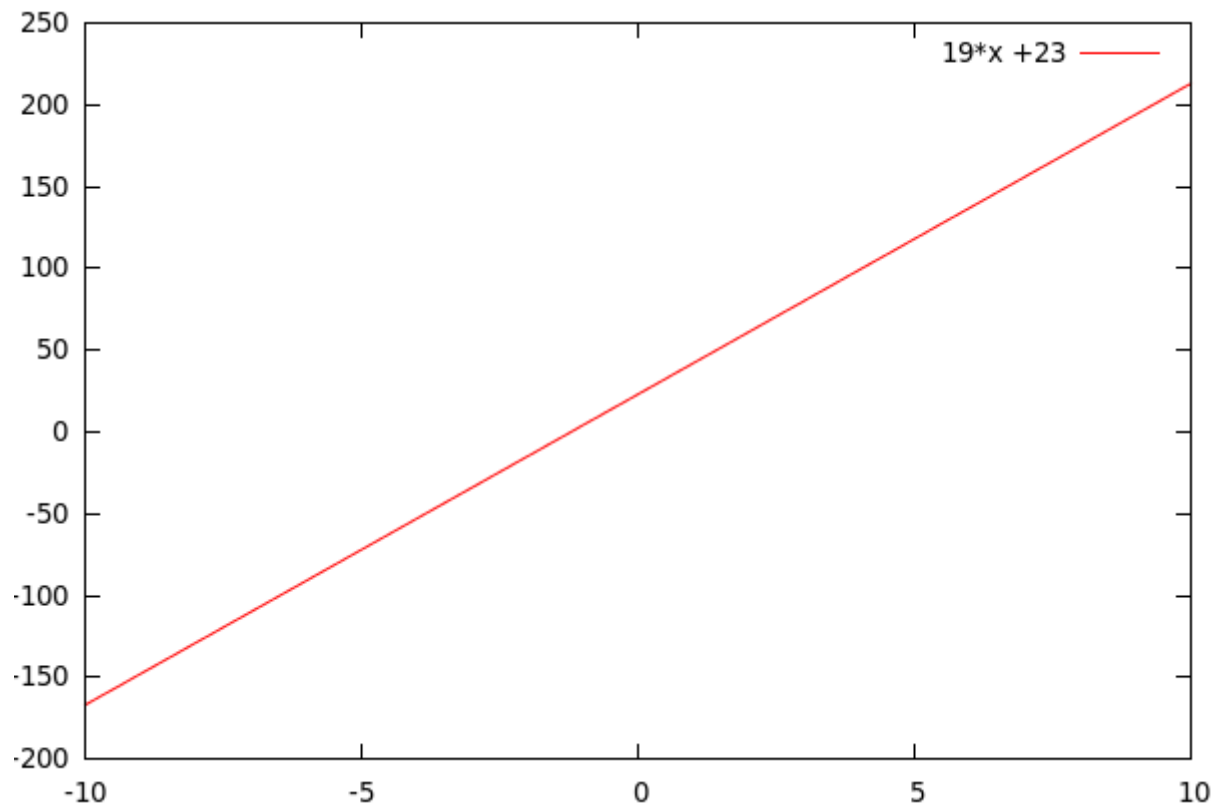
b) Caso Peor:

- Eficiencia Teórica:

$$T_p(n) = 4 + 4 + \sum_{i=0}^n (3 + 2 + 9) + 3 + [5n + 12](\text{resize})$$
$$= 19n + 23$$

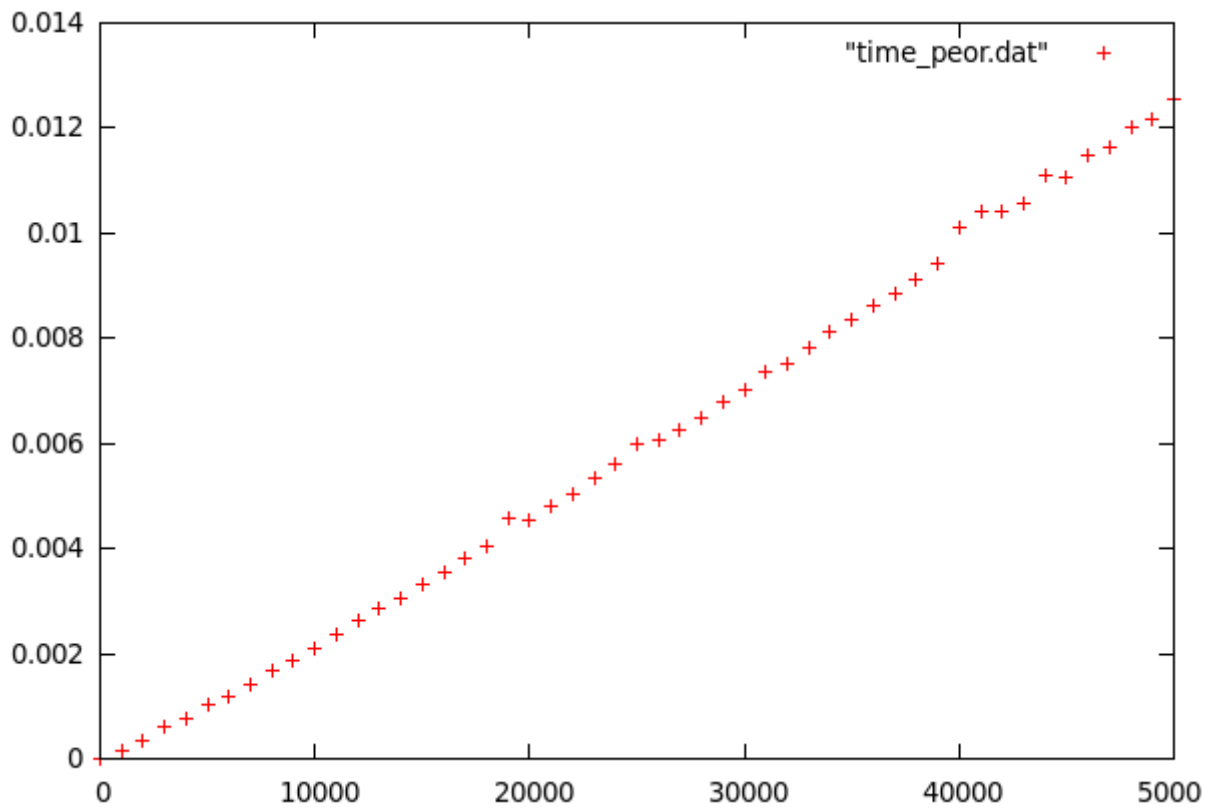
$$f(x) = 19 \cdot x + 23$$

plot f(x)



- Eficiencia empírica:

plot "time\_peor.dat"

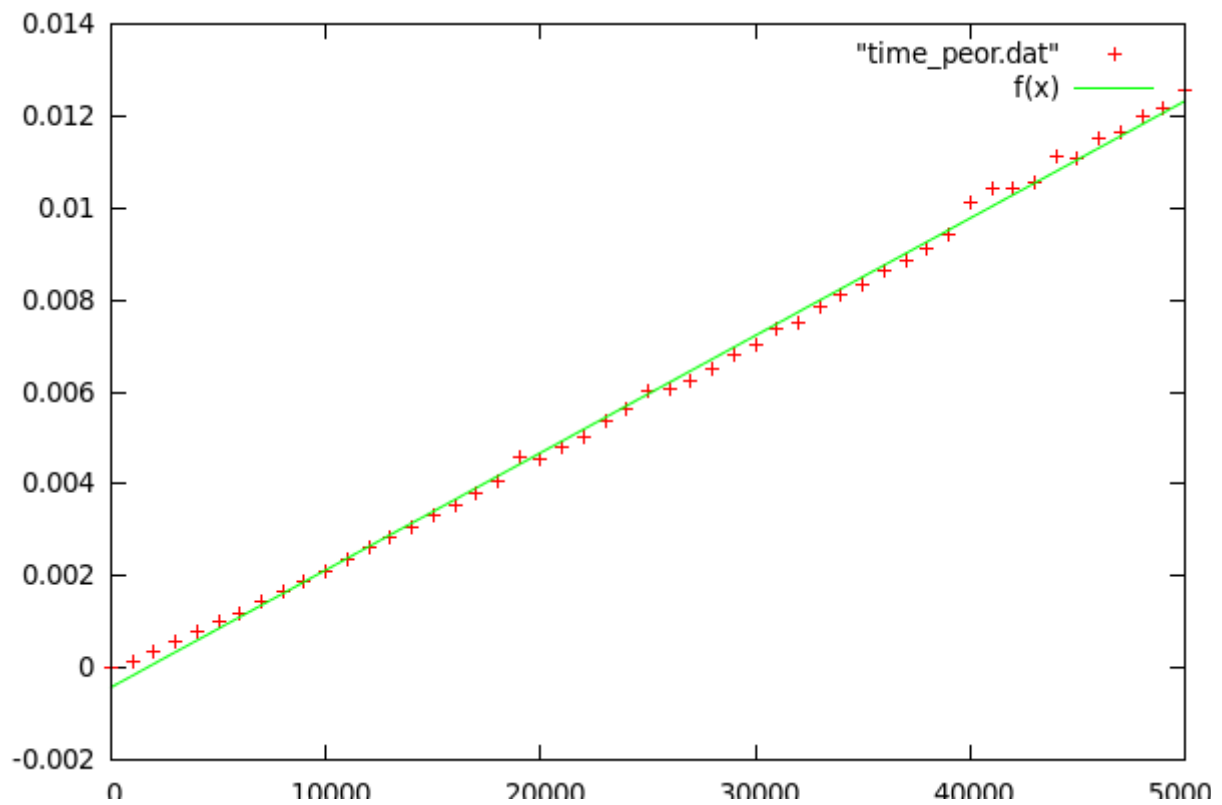


- Ajuste:

$$f(x) = a \cdot x + b$$

fit  $f(x)$  "time\_peor.dat" via  $a, b$

plot "time\_peor.dat",  $f(x)$



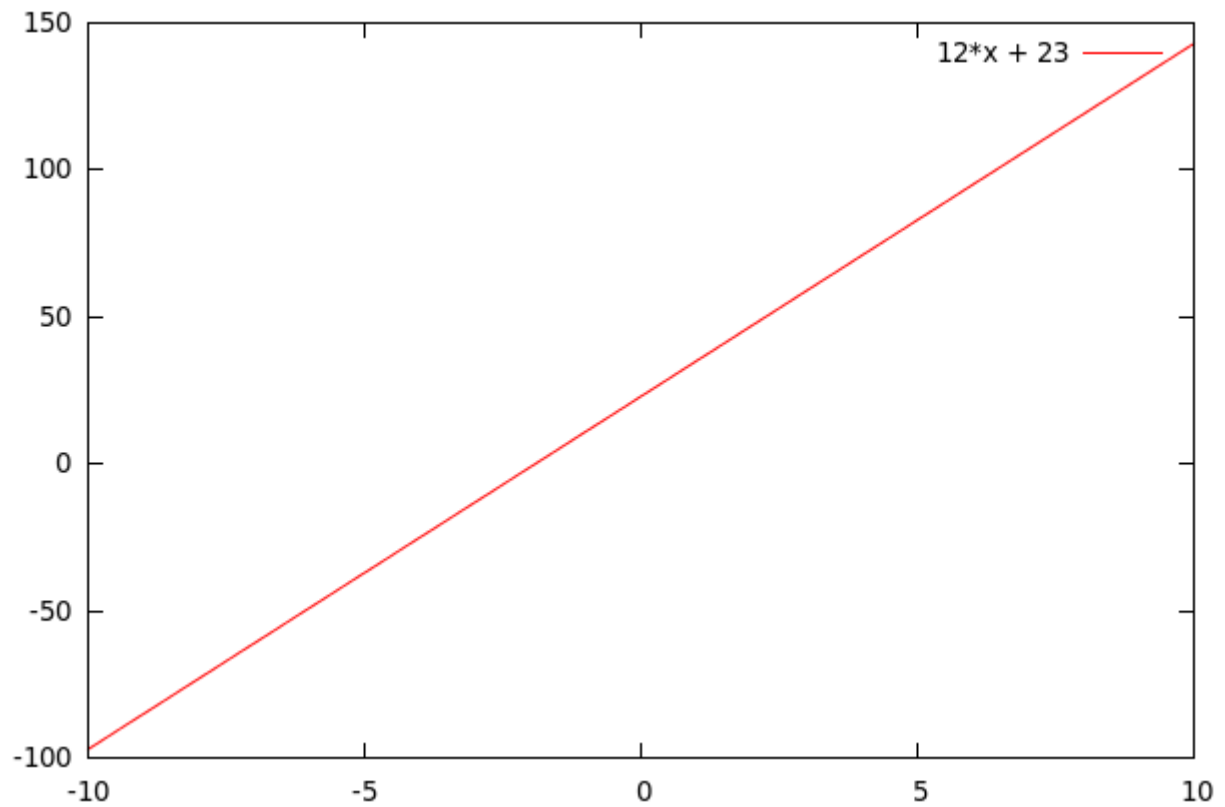
c) Caso Promedio:

- Eficiencia Teórica:

$$T_{1/2}(n) = 4 + 4 + \sum_{i=0}^{n/2} (3 + 2 + 9) + 3 + [5n + 12(\text{resize})]$$
$$= 12n + 23$$

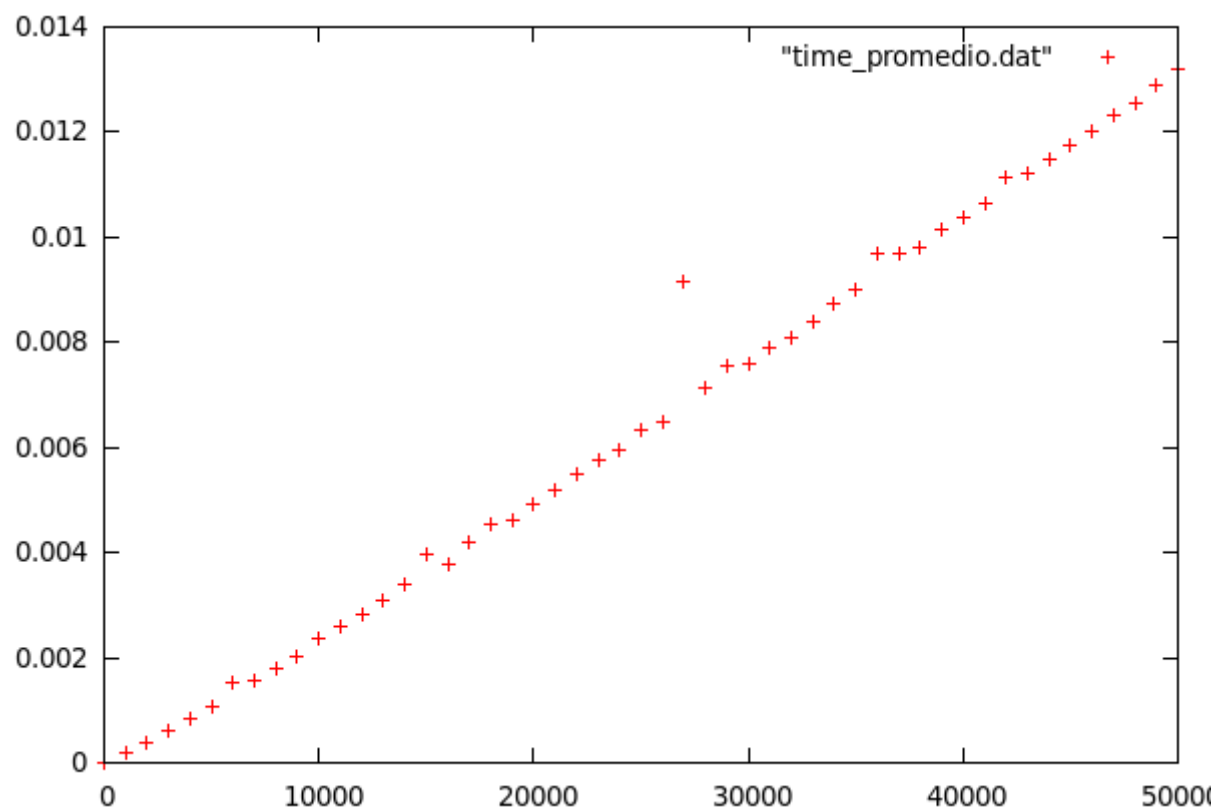
$$f(x) = 12 \cdot x + 23$$

plot f(x)



- Eficiencia empírica:

plot "time\_promedio.dat"



- Ajuste:

$$f(x) = a \cdot x + b$$

fit  $f(x)$  "time\_promedio.dat" via  $a, b$

plot "time\_promedio.dat",  $f(x)$

