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

### 1.- Ordenación por Selección:

- Código Fuente:

```
void Seleccion(int a[], int n){
    for (int i = 0; i < n - 1; ++i){
        int pmin = i;
        for (int j = i + 1; j < n; ++j){
            if (a[pmin] > a[j])
                j = pmin;
        }
        swap(a[i], a[pmin]);
    }
}
```

- Hardware:

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

- Sistema Operativo:

Ubuntu 14.04

- Compilador Utilizado:

g++ -std=c++11

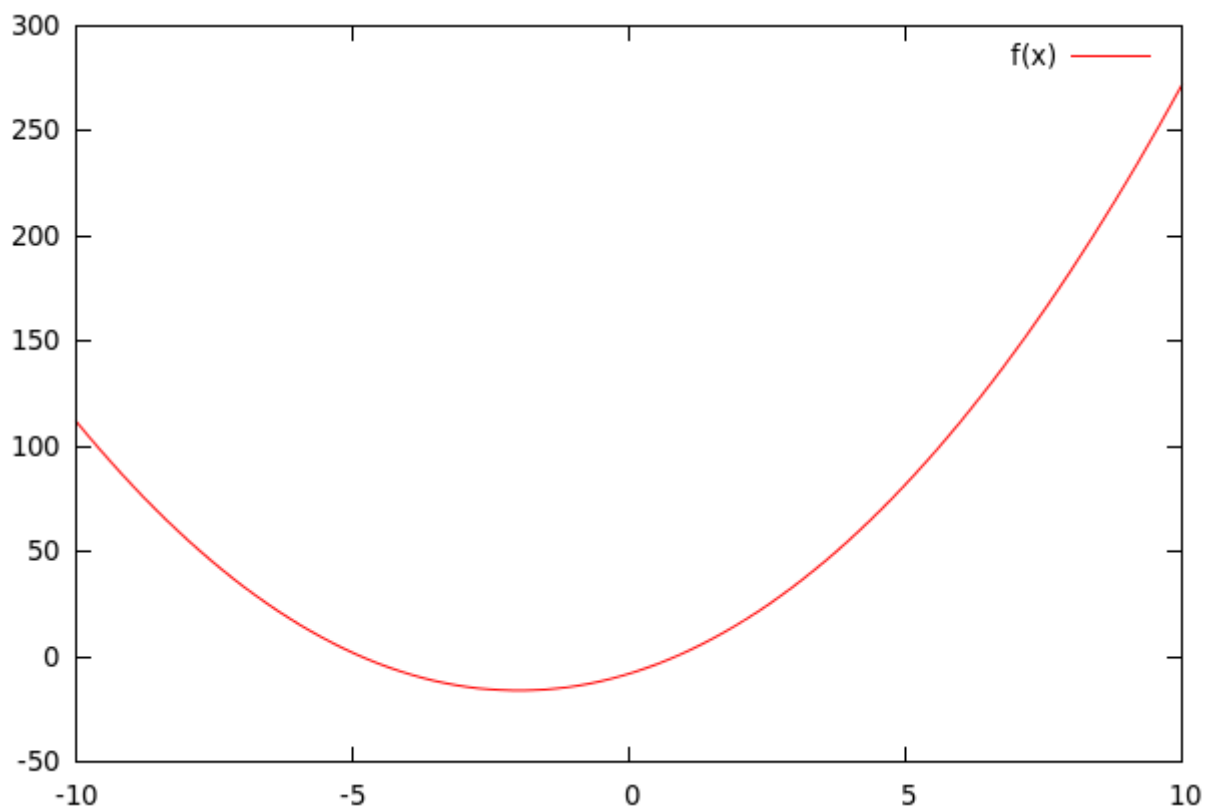
a) Caso Mejor:

- Eficiencia Teórica:

$$T_m(n) = 3 + \sum_{i=0}^{n-2} (1+3) + (\sum_{j=i+1}^{n-1} (3+1+1)) + 7$$
$$= 5/2n^2 + 17/2n - 8$$

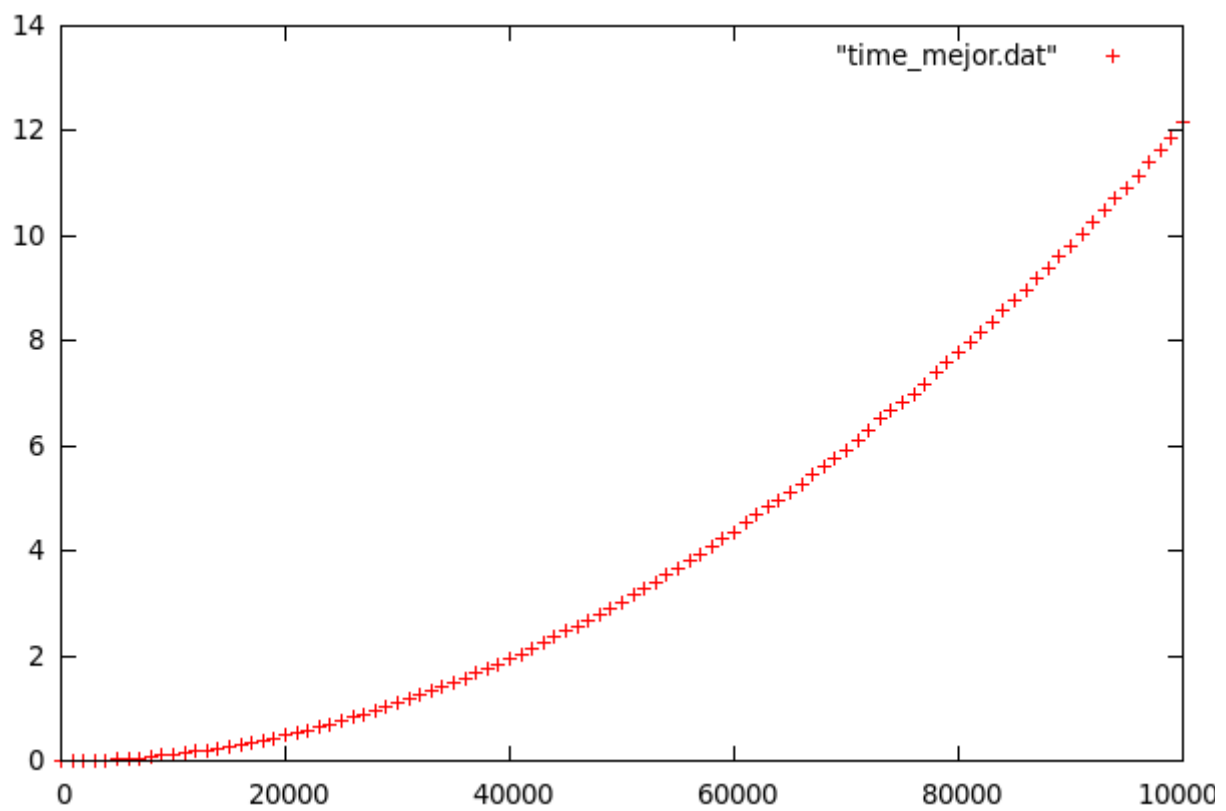
$$f(x) = (5/2)*x**2 + (17/2)*x - 8$$

plot f(x)



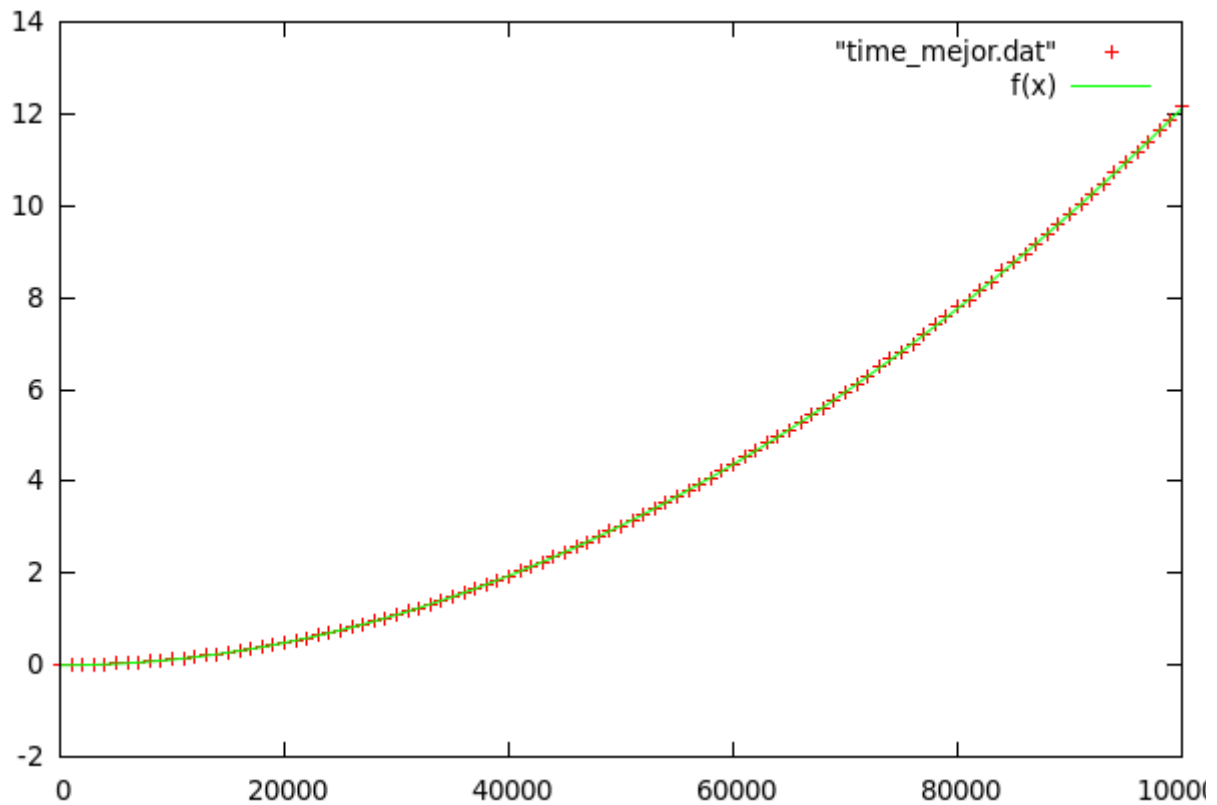
- Eficiencia empírica:

plot "time\_mejor.dat"



- Ajuste:

$f(x) = a*x**2 + b*x - c$   
fit  $f(x)$  "time\_mejor.dat" via a, b, c  
plot "time\_mejor.dat",  $f(x)$

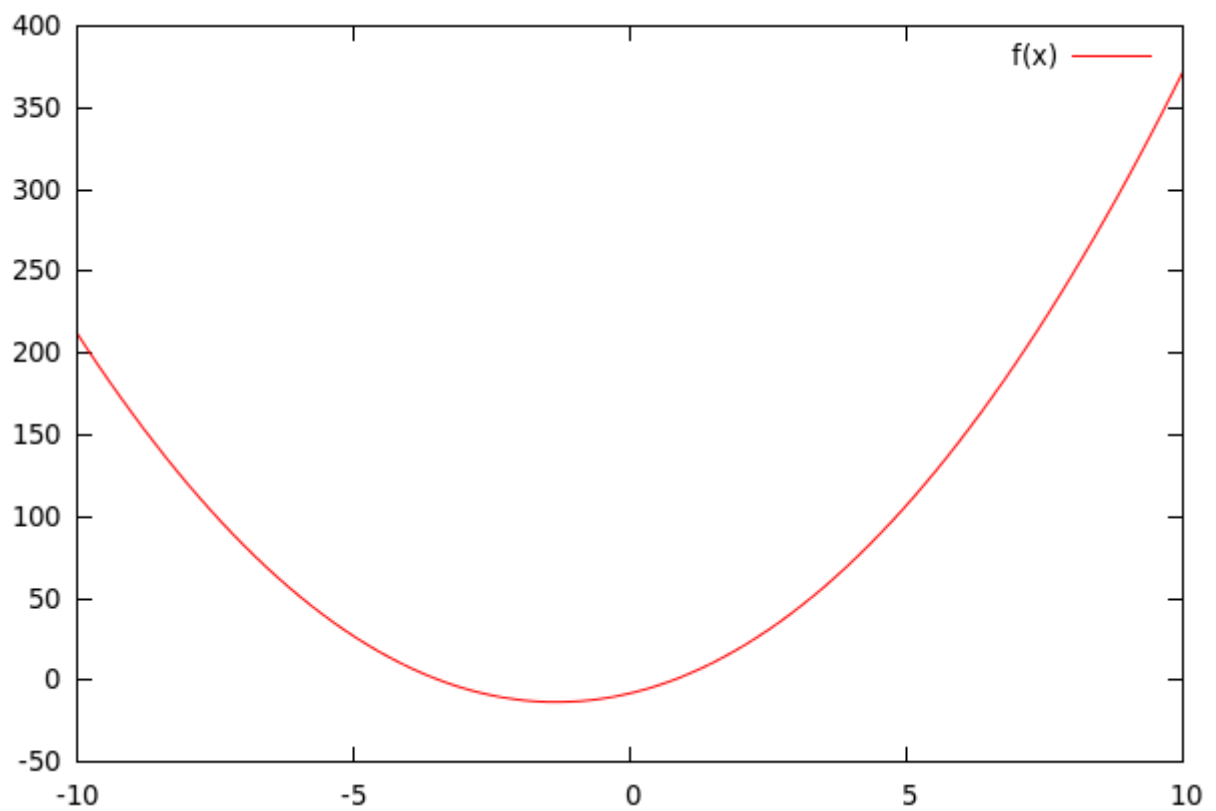


b) Caso Peor:

- Eficiencia Teórica:

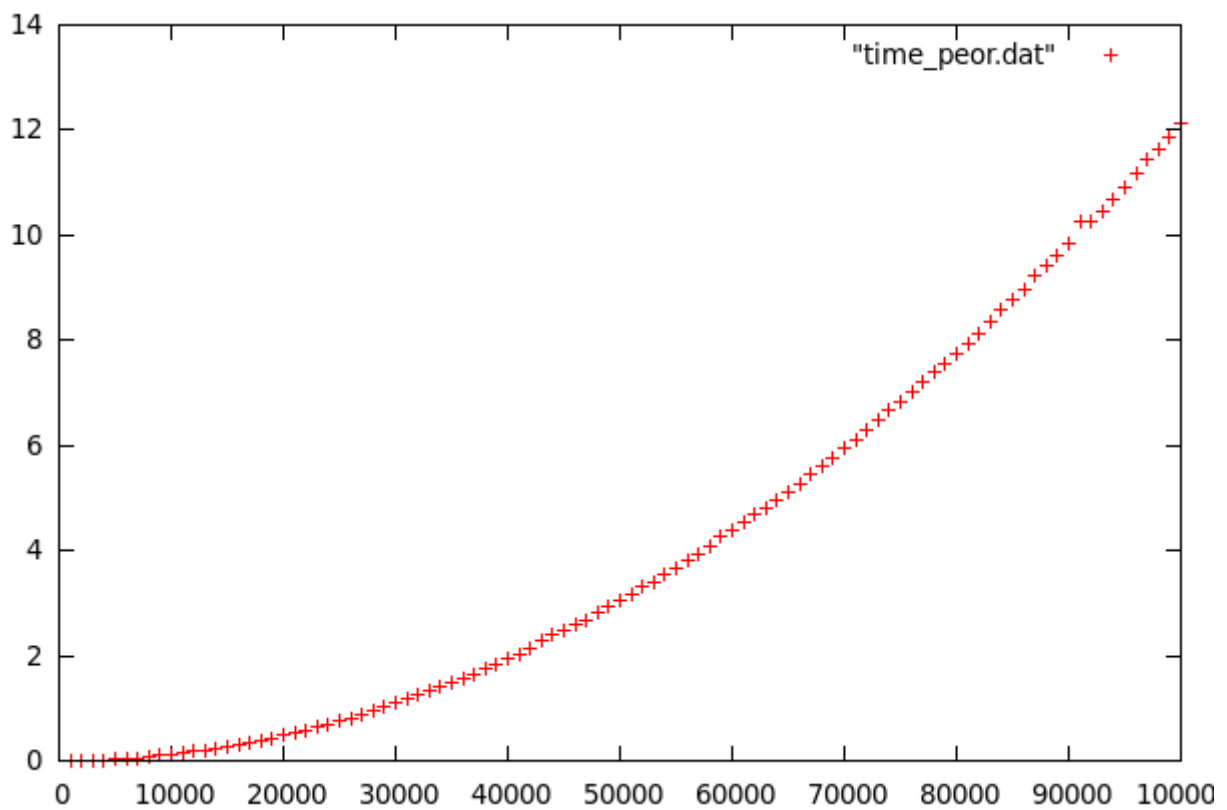
$$T_p(n) = 3 + \sum_{i=0}^{n-2} 1 + 3 + \sum_{j=i+1}^{n-1} (3+1+1+1) \\ = 3n^2 + 8n - 8$$

$f(x) = 3*x**2 + 8*x - 8$   
plot  $f(x)$



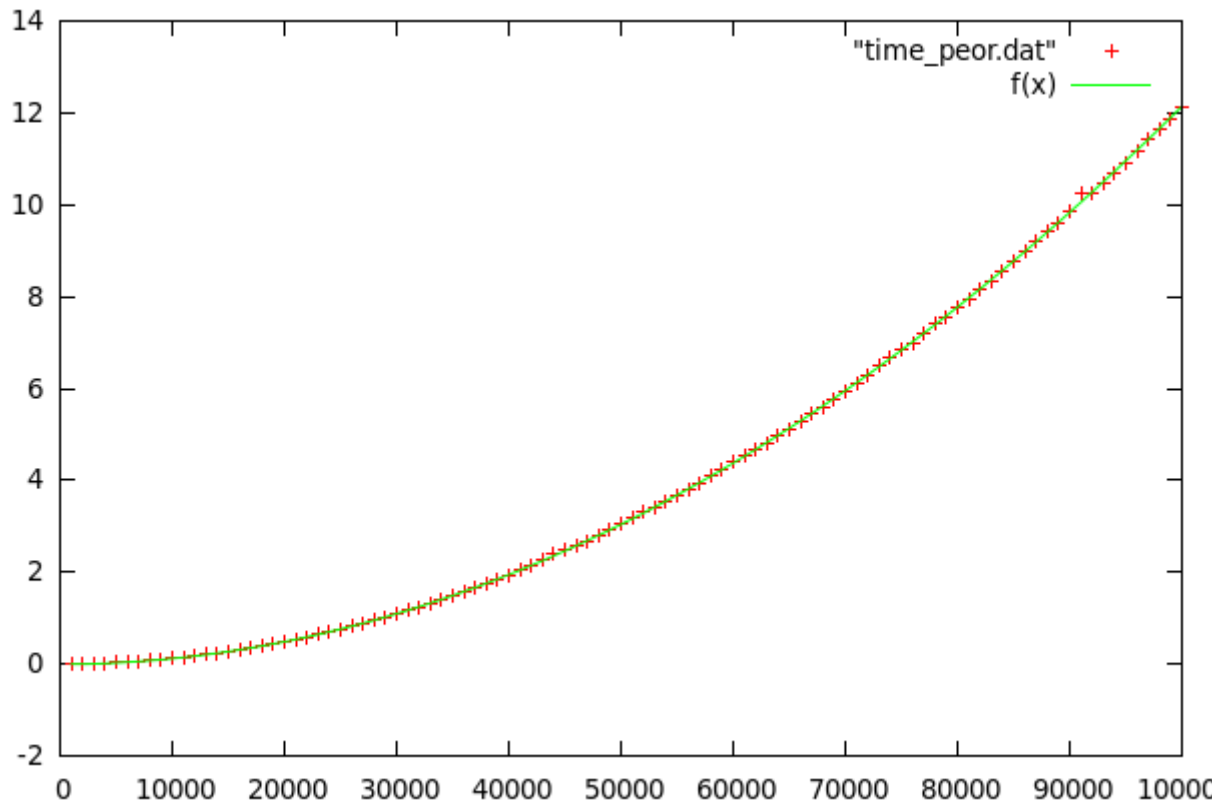
- Eficiencia empírica:

plot "time\_peor.dat"



- Ajuste:

$f(x) = a*x**2 + b*x - c$   
fit  $f(x)$  "time\_peor.dat" via a, b, c  
plot "time\_peor.dat",  $f(x)$

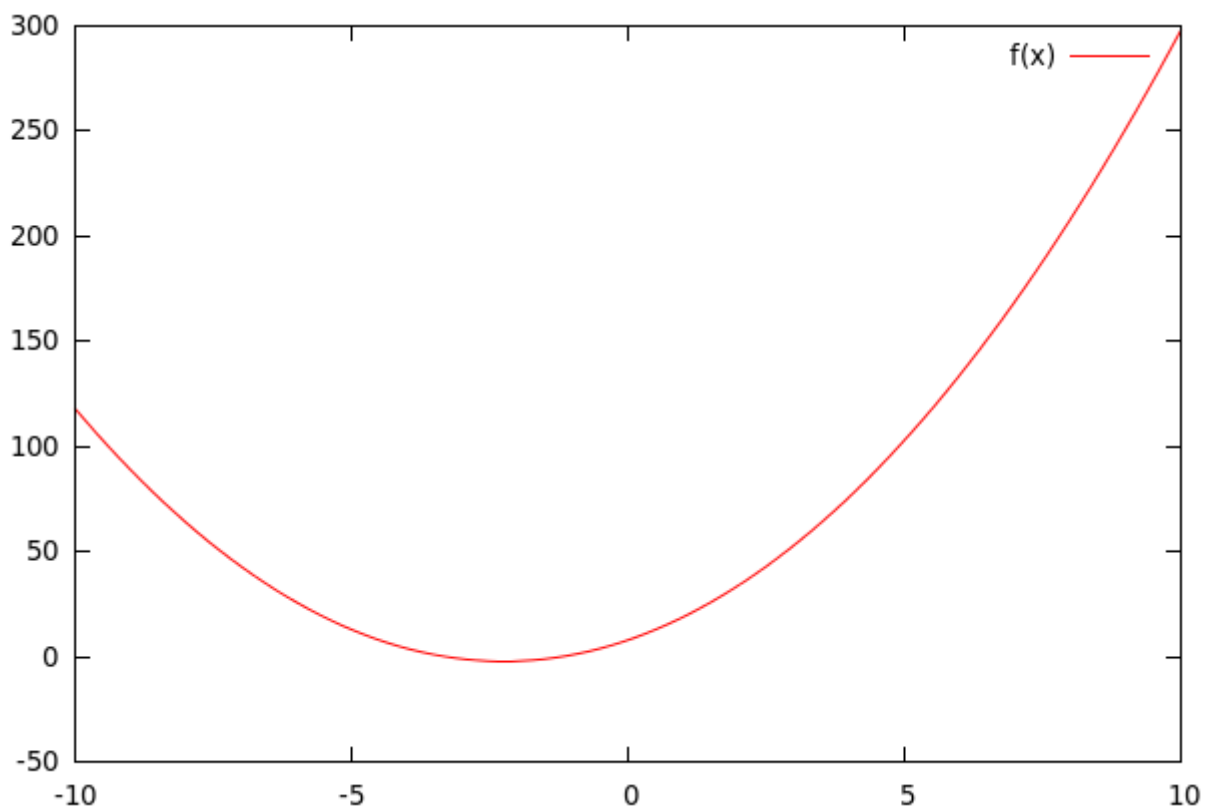


c) Caso Promedio:

- Eficiencia Teórica:

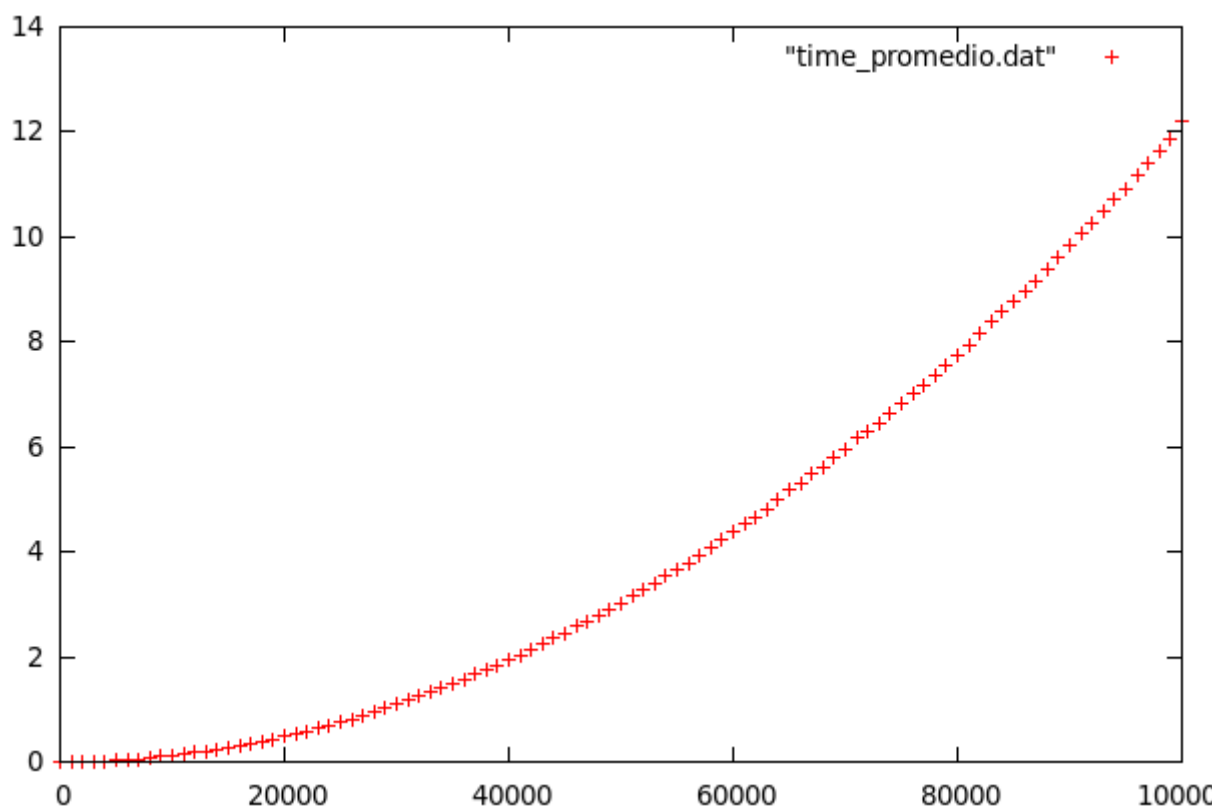
$$T_{1/2}(n) = 3 + \sum_{i=0}^{n-2} 1 + 3 + \sum_{j=i+1}^{n-1} (3 + 1 + 1 + 1/2) + 7$$
$$= 5/2n^2 + 39/4n + 8$$

$f(x) = (5/2)*x**2 + (39/4)*x + 8$   
plot  $f(x)$



- Eficiencia empírica:

plot "time\_promedio.dat"



- Ajuste:

$$f(x) = a*x**2 + b*x + c$$

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

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

