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Algorítmica – Práctica 1 – Ejercicio 1 - 2ºD

1.- Ordenación por Burbuja:

- Código Fuente:

```
void Burbuja(int num[], int tam){
      int i, j, flag = 1;
      int temp;
      int numLength = tam;
      for(i = 1; (i <= numLength) && flag; i++) {
            flag = 0;
            for (j=0; j < (numLength -1); j++) {
                  if (num[j+1] > num[j]) {
                        temp = num[j];
                        num[j] = num[j+1];
                        num[j+1] = temp;
                        flag = 1;
                  }
            }
      }
}
```

- Hardware:

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

- Sistema Operativo:

  Ubuntu 14.04

- Compilador Utilizado:

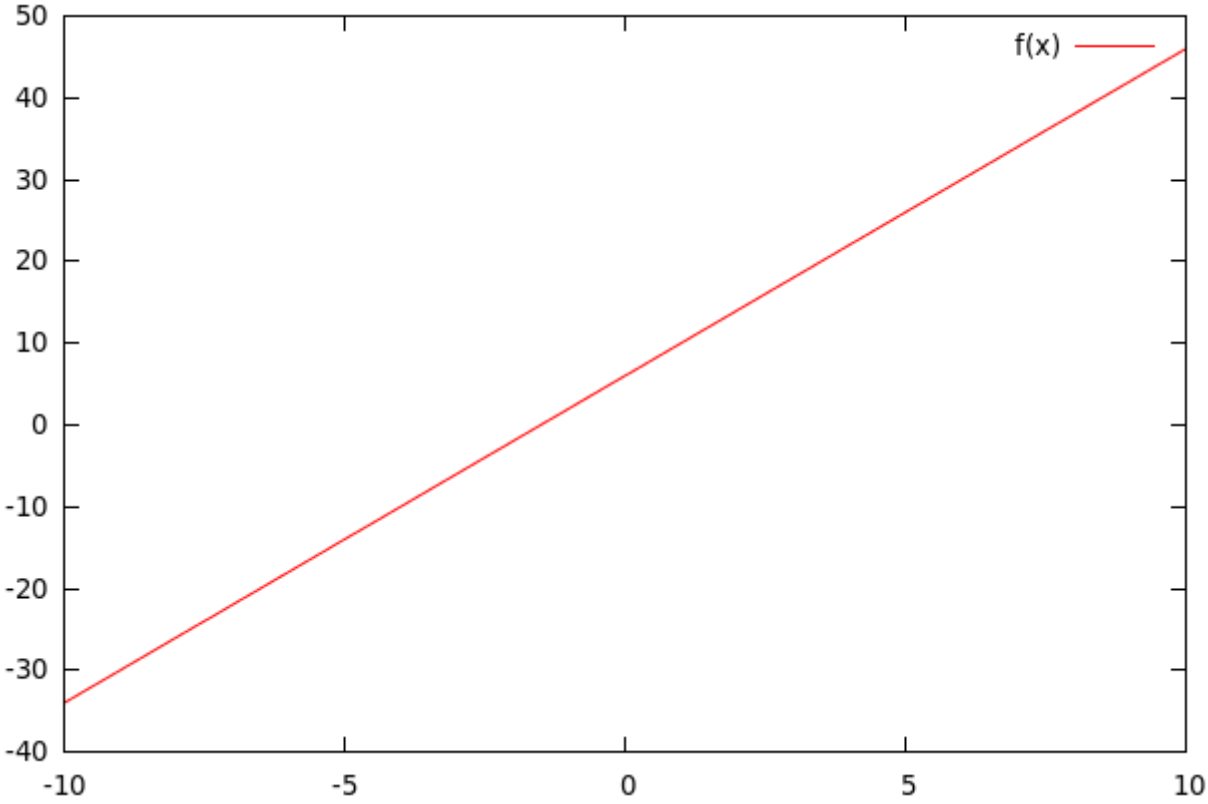
  g++ -std=c++11

a) Caso Mejor:

- Eficiencia Teórica:

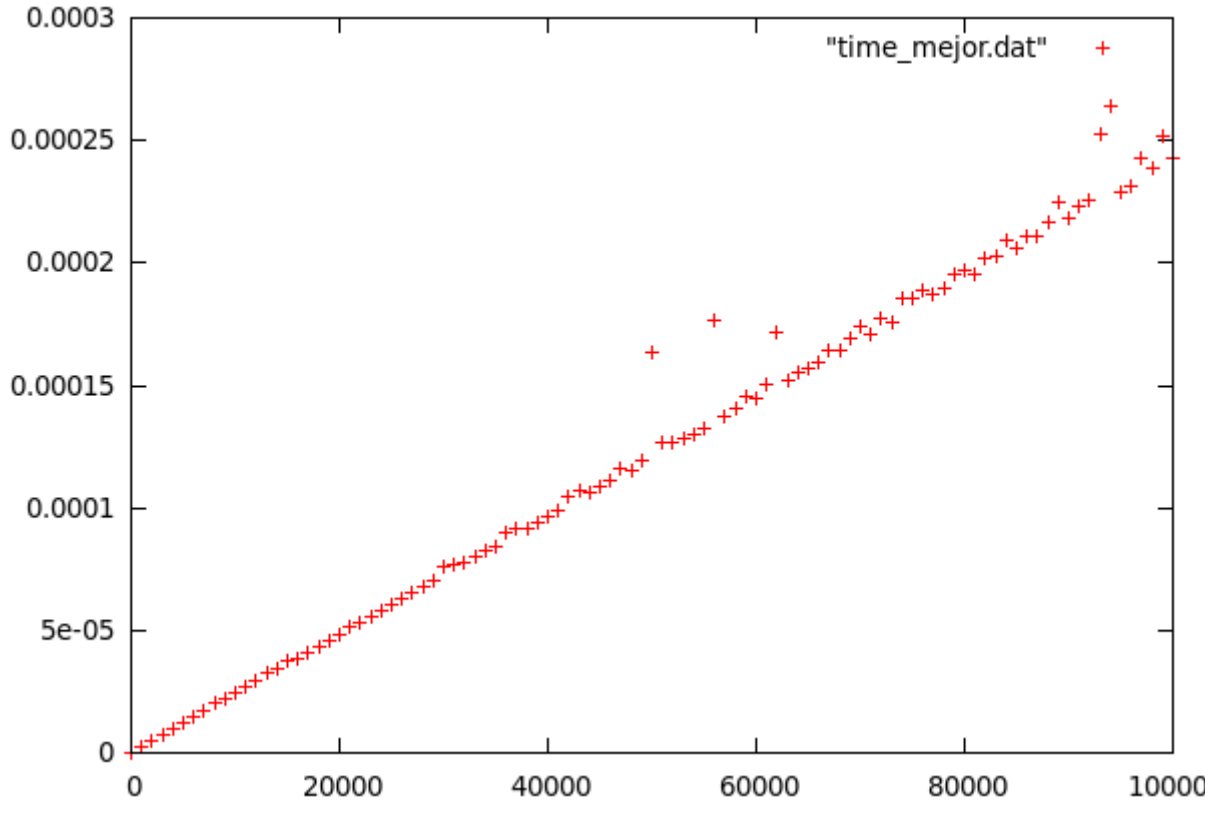
  $T_m(n) = 2 + \Sigma^n_{i=0}(4 + 1 + 2 + 2) + 4$
  $= 9n + 6$

f(x) = 9*x + 6
plot f(x)



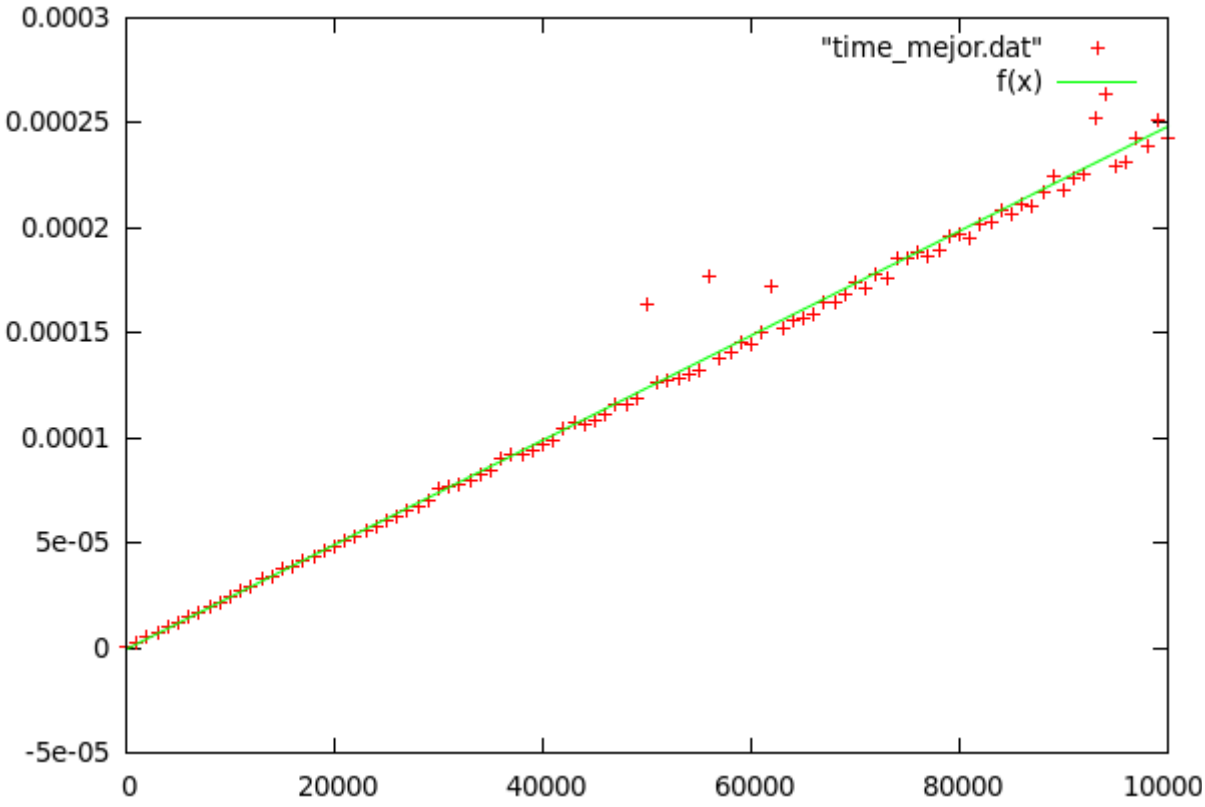
- Eficiencia empírica:

plot “time_mejor.dat”



- Ajuste:

f(x) = a*x – b
fit f(x) “time_mejor.dat” via a, b
plot “time_mejor.dat”, f(x)

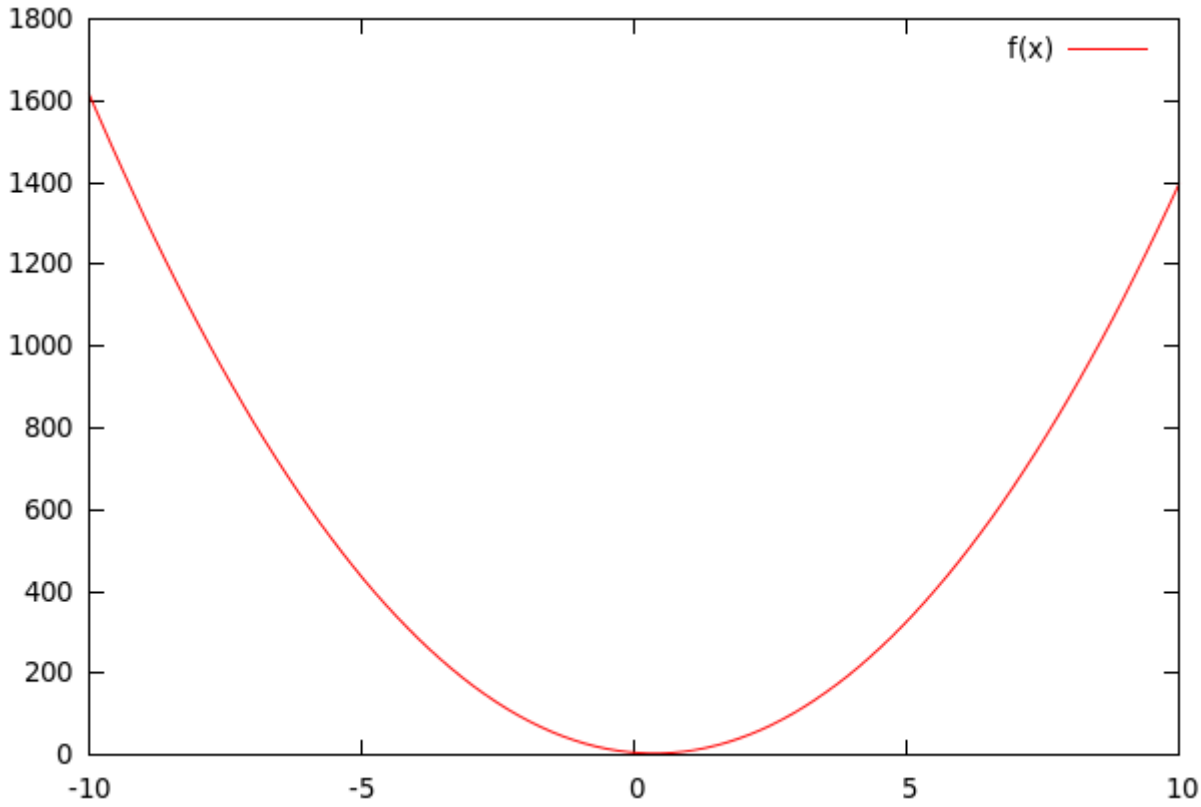


b) Caso Peor:

- Eficiencia Teórica:

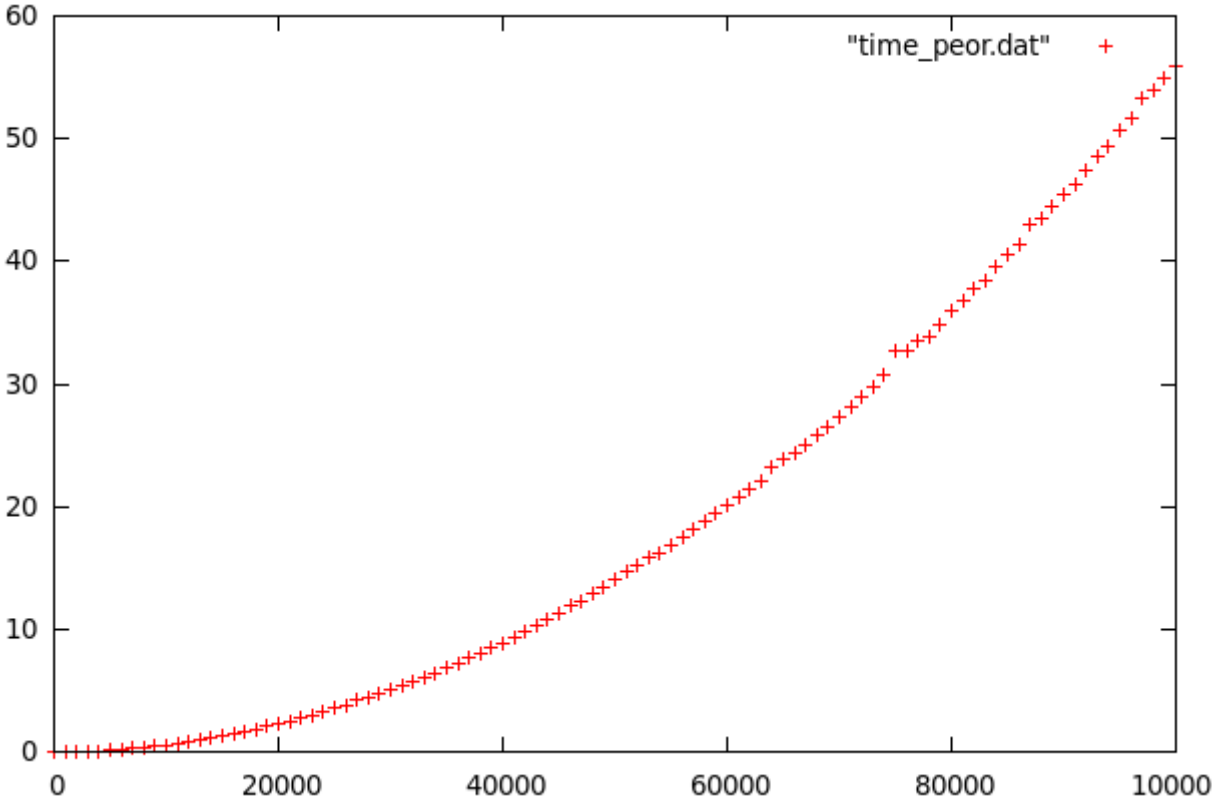
$T_p(n) = 2 + \Sigma^{n}_{i=0}(4 + 1 + \Sigma^{n-1}_{i=0}(2 + 6) + 2) + 4$
$= 15n^2 - 11n + 6$

f(x) = 15*x**2 - 11*x + 6
plot f(x)



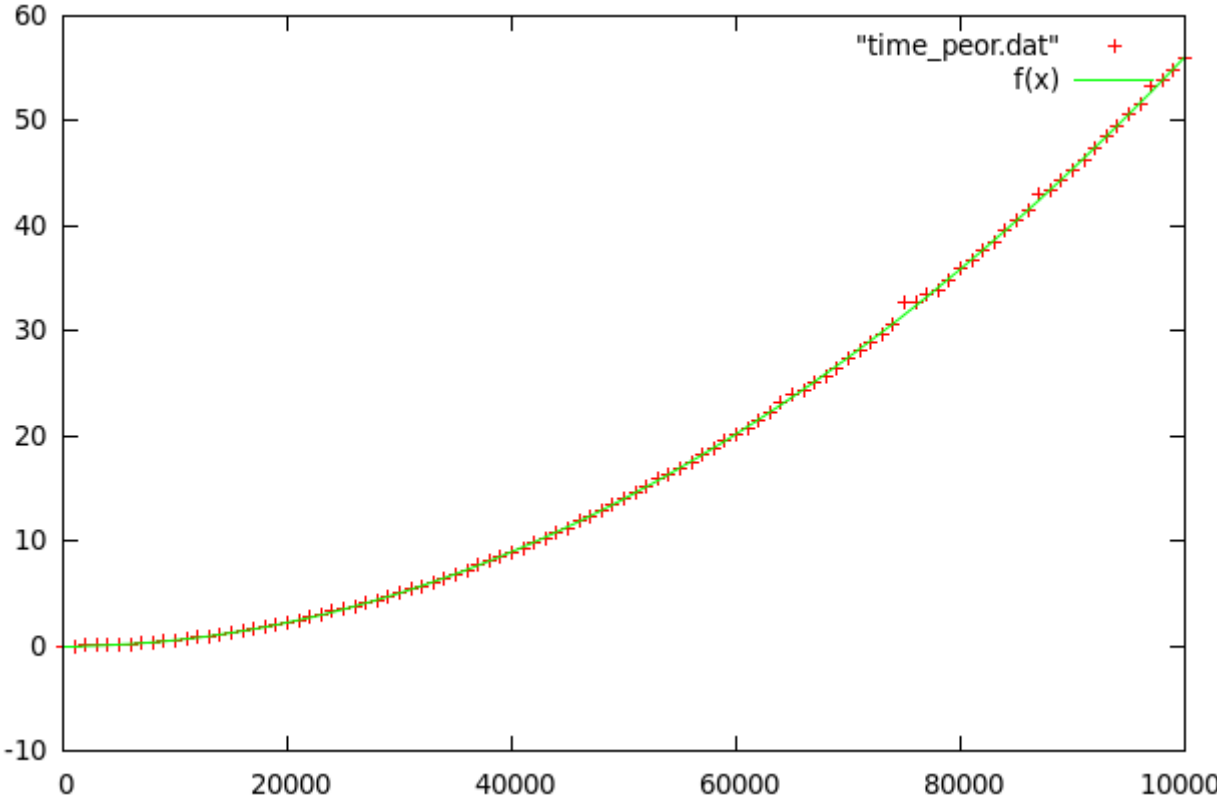
- Eficiencia empírica:

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)

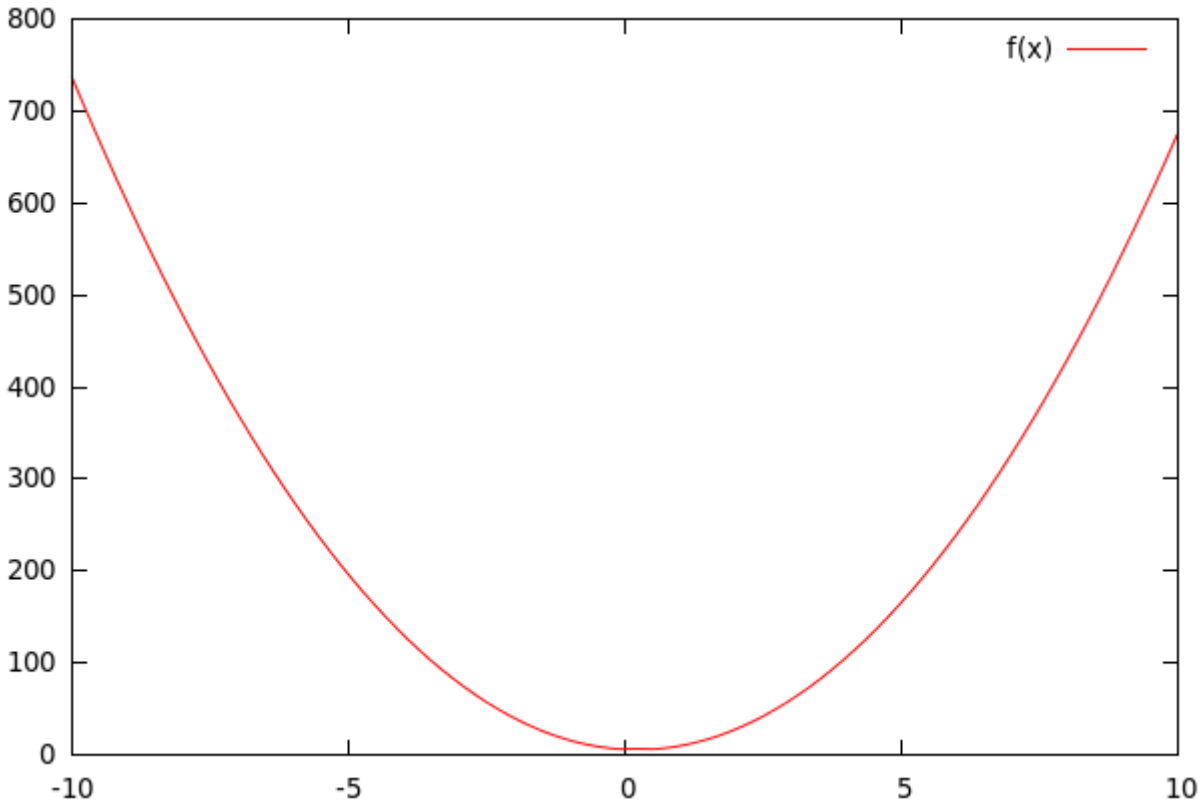


c) Caso Promedio:

- Eficiencia Teórica:

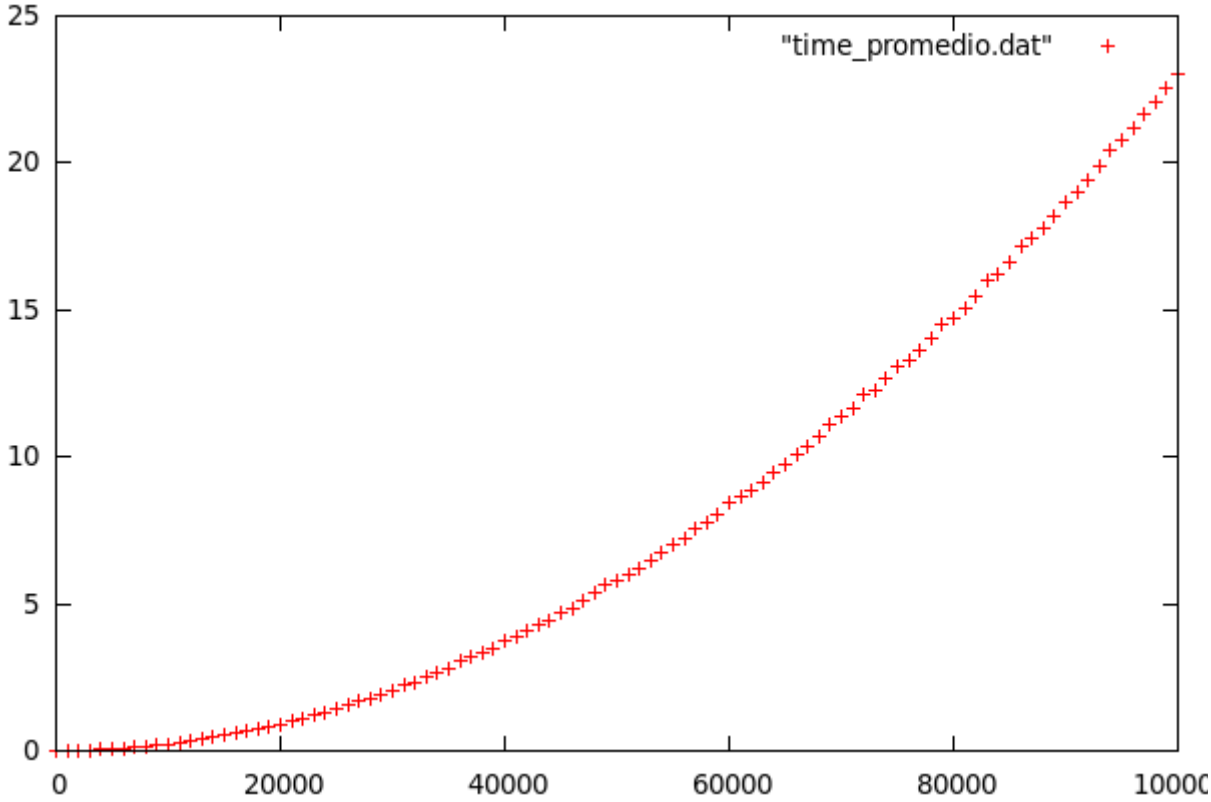
$T_{1/2}(n) = 2 + \Sigma^{n/2}_{i=0}(4 + 1 + \Sigma^{(n-1)/2}_{i=0}(2 + 6) + 2) + 4$
$= 2n^2 - 7/2n + 6$

f(x) = 2*x**2 - (7/2)*x + 6
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)