

# Respaldo grafico: “Comparación de Tiempos en Ejecución de Transpose datasets”

## Brute\_force:

```
yoyo@DESKTOP-U0ARGTD: /mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make compilar_brute_force
yoyo@DESKTOP-U0ARGTD: /mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make compilar_dynamic_programming
g++ -g -Wall dynamic_programming.cpp -o dynamic_programming
yoyo@DESKTOP-U0ARGTD: /mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_brute_force
valgrind --leak-check=yes ./brute_force
==7458== Memcheck, a memory error detector
==7458== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==7458== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==7458== Command: ./brute_force
==7458==
nj
jn
Distancia mínima: 1
El tiempo de ejecucion en segundos es: 0.01616
El tiempo de ejecucion en microsegundos es: 16160
==7458==
==7458== HEAP SUMMARY:
==7458==   in use at exit: 0 bytes in 0 blocks
==7458==   total heap usage: 71 allocs, 71 frees, 116,484 bytes allocated
==7458==
==7458== All heap blocks were freed -- no leaks are possible
==7458==
==7458== For lists of detected and suppressed errors, rerun with: -s
==7458== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
yoyo@DESKTOP-U0ARGTD: /mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_brute_force
valgrind --leak-check=yes ./brute_force
==7645== Memcheck, a memory error detector
==7645== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==7645== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==7645== Command: ./brute_force
==7645==
ypdxy
pyxdy
Distancia mínima: 2
El tiempo de ejecucion en segundos es: 0.012956
```

```
yoyo@DESKTOP-U0ARGTD: /mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation
El tiempo de ejecucion en microsegundos es: 12956

==7645==
==7645== HEAP SUMMARY:
==7645==   in use at exit: 0 bytes in 0 blocks
==7645==   total heap usage: 71 allocs, 71 frees, 116,490 bytes allocated
==7645==
==7645== All heap blocks were freed -- no leaks are possible
==7645==
==7645== For lists of detected and suppressed errors, rerun with: -s
==7645== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_brute_
force
valgrind --leak-check=yes ./brute_force
==7685== Memcheck, a memory error detector
==7685== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==7685== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==7685== Command: ./brute_force
==7685==
dyeaapxx
ydaepaxx
Distancia mínima: 3

El tiempo de ejecucion en segundos es: 0.028852

El tiempo de ejecucion en microsegundos es: 28852

==7685==
==7685== HEAP SUMMARY:
==7685==   in use at exit: 0 bytes in 0 blocks
==7685==   total heap usage: 71 allocs, 71 frees, 116,496 bytes allocated
==7685==
==7685== All heap blocks were freed -- no leaks are possible
==7685==
==7685== For lists of detected and suppressed errors, rerun with: -s
==7685== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_brute_
force
valgrind --leak-check=yes ./brute_force
==7775== Memcheck, a memory error detector
==7775== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==7775== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==7775== Command: ./brute_force
==7775==
mfchwklli
fmhckwlli
Distancia mínima: 3

El tiempo de ejecucion en segundos es: 0.120391

El tiempo de ejecucion en microsegundos es: 120391

==7775==
==7775== HEAP SUMMARY:
==7775==   in use at exit: 0 bytes in 0 blocks
==7775==   total heap usage: 71 allocs, 71 frees, 116,498 bytes allocated
==7775==
==7775== All heap blocks were freed -- no leaks are possible
==7775==
==7775== For lists of detected and suppressed errors, rerun with: -s
==7775== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_brute_
force
valgrind --leak-check=yes ./brute_force
==7811== Memcheck, a memory error detector
==7811== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==7811== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==7811== Command: ./brute_force
==7811==
psscujowfsk
spncjuwosfk
Distancia mínima: 5

El tiempo de ejecucion en segundos es: 3.93128

El tiempo de ejecucion en microsegundos es: 3931280

==7811==
==7811== HEAP SUMMARY:
==7811==   in use at exit: 0 bytes in 0 blocks
==7811==   total heap usage: 71 allocs, 71 frees, 116,502 bytes allocated
==7811==
==7811== All heap blocks were freed -- no leaks are possible
==7811==
==7811== For lists of detected and suppressed errors, rerun with: -s
==7811== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
```

**Dynamic Programming:**

```

yoyo@DESKTOP-U0ARGTD: /mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_dynami
c_programming
valgrind --leak-check=yes ./dynamic_programming
==11151== Memcheck, a memory error detector
==11151== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==11151== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==11151== Command: ./dynamic_programming
==11151==
nj
jn
Distancia mínima: 1

El tiempo de ejecucion en segundos es: 0.024023

El tiempo de ejecucion en microsegundos es: 24023

==11151==
==11151== HEAP SUMMARY:
==11151==   in use at exit: 0 bytes in 0 blocks
==11151== total heap usage: 76 allocs, 76 frees, 116,604 bytes allocated
==11151==
==11151== All heap blocks were freed -- no leaks are possible
==11151==
==11151== For lists of detected and suppressed errors, rerun with: -s
==11151== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_dynami
c_programming
valgrind --leak-check=yes ./dynamic_programming
==11236== Memcheck, a memory error detector
==11236== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==11236== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==11236== Command: ./dynamic_programming
==11236==
ypdxy
pyxdy
Distancia mínima: 2

El tiempo de ejecucion en segundos es: 0.0211

El tiempo de ejecucion en microsegundos es: 21100

==11236==
==11236== HEAP SUMMARY:
==11236==   in use at exit: 0 bytes in 0 blocks

```

```

yoyo@DESKTOP-U0ARGTD: /mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation
==11236== total heap usage: 79 allocs, 79 frees, 116,802 bytes allocated
==11236==
==11236== All heap blocks were freed -- no leaks are possible
==11236==
==11236== For lists of detected and suppressed errors, rerun with: -s
==11236== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_dynami
c_programming
valgrind --leak-check=yes ./dynamic_programming
==11274== Memcheck, a memory error detector
==11274== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==11274== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==11274== Command: ./dynamic_programming
==11274==
dyeapxx
ydaepaxx
Distancia mínima: 3

El tiempo de ejecucion en segundos es: 0.019574

El tiempo de ejecucion en microsegundos es: 19574

==11274==
==11274== HEAP SUMMARY:
==11274==   in use at exit: 0 bytes in 0 blocks
==11274== total heap usage: 82 allocs, 82 frees, 117,072 bytes allocated
==11274==
==11274== All heap blocks were freed -- no leaks are possible
==11274==
==11274== For lists of detected and suppressed errors, rerun with: -s
==11274== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_dynami
c_programming
valgrind --leak-check=yes ./dynamic_programming
==11341== Memcheck, a memory error detector
==11341== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==11341== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==11341== Command: ./dynamic_programming
==11341==
mfchkwlli
fmhckwlli
Distancia mínima: 3

El tiempo de ejecucion en segundos es: 0.019883

```

```
yoyo@DESKTOP-U0ARGTD: /mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation
El tiempo de ejecucion en microsegundos es: 19883

==11341==
==11341== HEAP SUMMARY:
==11341==    in use at exit: 0 bytes in 0 blocks
==11341==   total heap usage: 83 allocs, 83 frees, 117,178 bytes allocated
==11341==
==11341== All heap blocks were freed -- no leaks are possible
==11341==
==11341== For lists of detected and suppressed errors, rerun with: -s
==11341== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_dynami
c_programming
valgrind --leak-check=yes ./dynamic_programming
==11371== Memcheck, a memory error detector
==11371== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==11371== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==11371== Command: ./dynamic_programming
==11371==
pscnujowfsk
spncjuwosfk
Distancia mínima: 5

EL tiempo de ejecucion en segundos es: 0.027025

El tiempo de ejecucion en microsegundos es: 27025

==11371==
==11371== HEAP SUMMARY:
==11371==    in use at exit: 0 bytes in 0 blocks
==11371==   total heap usage: 85 allocs, 85 frees, 117,414 bytes allocated
==11371==
==11371== All heap blocks were freed -- no leaks are possible
==11371==
==11371== For lists of detected and suppressed errors, rerun with: -s
==11371== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$
```

## ***Respaldo grafico: “Comparación de Tiempos en Ejecución de Semiordered datasets”***

Brute Force:

```

yoyo@DESKTOP-U0ARGTD: /mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_brute_force
valgrind --leak-check=yes ./brute_force
==12986== Memcheck, a memory error detector
==12986== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==12986== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==12986== Command: ./brute_force
==12986==
ct
tc
Distancia mínima: 1

El tiempo de ejecucion en segundos es: 0.014218

El tiempo de ejecucion en microsegundos es: 14218

==12986==
==12986== HEAP SUMMARY:
==12986==   in use at exit: 0 bytes in 0 blocks
==12986==   total heap usage: 71 allocs, 71 frees, 116,484 bytes allocated
==12986==
==12986== All heap blocks were freed -- no leaks are possible
==12986==
==12986== For lists of detected and suppressed errors, rerun with: -s
==12986== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_brute_force
valgrind --leak-check=yes ./brute_force
==13026== Memcheck, a memory error detector
==13026== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==13026== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==13026== Command: ./brute_force
==13026==
exkz
kzex
Distancia mínima: 4

El tiempo de ejecucion en segundos es: 0.012048

El tiempo de ejecucion en microsegundos es: 12048

==13026==
==13026== HEAP SUMMARY:
==13026==   in use at exit: 0 bytes in 0 blocks

```

```

==13026==   total heap usage: 71 allocs, 71 frees, 116,488 bytes allocated
==13026==
==13026== All heap blocks were freed -- no leaks are possible
==13026==
==13026== For lists of detected and suppressed errors, rerun with: -s
==13026== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_brute_force
valgrind --leak-check=yes ./brute_force
==13077== Memcheck, a memory error detector
==13077== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==13077== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==13077== Command: ./brute_force
==13077==
futzrn
zrnfut
Distancia mínima: 6

El tiempo de ejecucion en segundos es: 0.032464

El tiempo de ejecucion en microsegundos es: 32464

==13077==
==13077== HEAP SUMMARY:
==13077==   in use at exit: 0 bytes in 0 blocks
==13077==   total heap usage: 71 allocs, 71 frees, 116,492 bytes allocated
==13077==
==13077== All heap blocks were freed -- no leaks are possible
==13077==
==13077== For lists of detected and suppressed errors, rerun with: -s
==13077== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_brute_force
valgrind --leak-check=yes ./brute_force
==13131== Memcheck, a memory error detector
==13131== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==13131== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==13131== Command: ./brute_force
==13131==
hhexdyty
dytyhhex
Distancia mínima: 8

El tiempo de ejecucion en segundos es: 0.603942

```

```
yoyo@DESKTOP-U0ARGTD: /mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation
El tiempo de ejecucion en microsegundos es: 603942

==13131==
==13131== HEAP SUMMARY:
==13131==    in use at exit: 0 bytes in 0 blocks
==13131==   total heap usage: 71 allocs, 71 frees, 116,496 bytes allocated
==13131==
==13131== All heap blocks were freed -- no leaks are possible
==13131==
==13131== For lists of detected and suppressed errors, rerun with: -s
==13131== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_brute_
force
valgrind --leak-check=yes ./brute_force
==13171== Memcheck, a memory error detector
==13171== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==13171== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==13171== Command: ./brute_force
==13171==
ynpactcbqy
tcbqynpac
Distancia mínima: 10

El tiempo de ejecucion en segundos es: 20.8217

El tiempo de ejecucion en microsegundos es: 20821664

==13171==
==13171== HEAP SUMMARY:
==13171==    in use at exit: 0 bytes in 0 blocks
==13171==   total heap usage: 71 allocs, 71 frees, 116,500 bytes allocated
==13171==
==13171== All heap blocks were freed -- no leaks are possible
==13171==
==13171== For lists of detected and suppressed errors, rerun with: -s
==13171== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$
```

## Dynamic Programming:



```

yoyo@DESKTOP-U0ARGTD: /mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_dynami
c_programming
valgrind --leak-check=yes ./dynamic_programming
==13655== Memcheck, a memory error detector
==13655== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==13655== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==13655== Command: ./dynamic_programming
==13655==
ct
tc
Distancia mínima: 1

El tiempo de ejecucion en segundos es: 0.019347

El tiempo de ejecucion en microsegundos es: 19347

==13655==
==13655== HEAP SUMMARY:
==13655==   in use at exit: 0 bytes in 0 blocks
==13655== total heap usage: 76 allocs, 76 frees, 116,604 bytes allocated
==13655==
==13655== All heap blocks were freed -- no leaks are possible
==13655==
==13655== For lists of detected and suppressed errors, rerun with: -s
==13655== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_dynami
c_programming
valgrind --leak-check=yes ./dynamic_programming
==13730== Memcheck, a memory error detector
==13730== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==13730== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==13730== Command: ./dynamic_programming
==13730==
exkz
kzex
Distancia mínima: 4

El tiempo de ejecucion en segundos es: 0.036098

El tiempo de ejecucion en microsegundos es: 36098

==13730==
==13730== HEAP SUMMARY:
==13730==   in use at exit: 0 bytes in 0 blocks

```

```

yoyo@DESKTOP-U0ARGTD: /mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation
==13730== total heap usage: 78 allocs, 78 frees, 116,728 bytes allocated
==13730==
==13730== All heap blocks were freed -- no leaks are possible
==13730==
==13730== For lists of detected and suppressed errors, rerun with: -s
==13730== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_dynami
c_programming
valgrind --leak-check=yes ./dynamic_programming
==13766== Memcheck, a memory error detector
==13766== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==13766== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==13766== Command: ./dynamic_programming
==13766==
futzrn
zrnfut
Distancia mínima: 6

El tiempo de ejecucion en segundos es: 0.036963

El tiempo de ejecucion en microsegundos es: 36963

==13766==
==13766== HEAP SUMMARY:
==13766==   in use at exit: 0 bytes in 0 blocks
==13766== total heap usage: 80 allocs, 80 frees, 116,884 bytes allocated
==13766==
==13766== All heap blocks were freed -- no leaks are possible
==13766==
==13766== For lists of detected and suppressed errors, rerun with: -s
==13766== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_dynami
c_programming
valgrind --leak-check=yes ./dynamic_programming
==13784== Memcheck, a memory error detector
==13784== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==13784== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==13784== Command: ./dynamic_programming
==13784==
hhexdyt
dytyhhex
Distancia mínima: 8

El tiempo de ejecucion en segundos es: 0.039428

```

```
yoyo@DESKTOP-U0ARGTD: /mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation
El tiempo de ejecucion en microsegundos es: 39428

==13784==
==13784== HEAP SUMMARY:
==13784==   in use at exit: 0 bytes in 0 blocks
==13784==   total heap usage: 82 allocs, 82 frees, 117,072 bytes allocated
==13784==
==13784== All heap blocks were freed -- no leaks are possible
==13784==
==13784== For lists of detected and suppressed errors, rerun with: -s
==13784== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_dynami
c_programming
valgrind --leak-check=yes ./dynamic_programming
==13829== Memcheck, a memory error detector
==13829== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==13829== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==13829== Command: ./dynamic_programming
==13829==
ynpactcbqy
tcbqyynpac
Distancia mínima: 10

El tiempo de ejecucion en segundos es: 0.026698

El tiempo de ejecucion en microsegundos es: 26698

==13829==
==13829== HEAP SUMMARY:
==13829==   in use at exit: 0 bytes in 0 blocks
==13829==   total heap usage: 84 allocs, 84 frees, 117,292 bytes allocated
==13829==
==13829== All heap blocks were freed -- no leaks are possible
==13829==
==13829== For lists of detected and suppressed errors, rerun with: -s
==13829== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$
```

## ***Respaldo grafico: “Comparación de Tiempos en Ejecución de Disordered datasets”***

Brute Force:

```
yoyo@DESKTOP-U0ARGTD: /mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_brute_force
valgrind --leak-check=yes ./brute_force
==14741== Memcheck, a memory error detector
==14741== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==14741== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==14741== Command: ./brute_force
==14741==
fm
ua
Distancia mínima: 4

EL tiempo de ejecucion en segundos es: 0.010932

El tiempo de ejecucion en microsegundos es: 10932

==14741==
==14741== HEAP SUMMARY:
==14741==   in use at exit: 0 bytes in 0 blocks
==14741==   total heap usage: 71 allocs, 71 frees, 116,484 bytes allocated
==14741==
==14741== All heap blocks were freed -- no leaks are possible
==14741==
==14741== For lists of detected and suppressed errors, rerun with: -s
==14741== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_brute_force
valgrind --leak-check=yes ./brute_force
==14789== Memcheck, a memory error detector
==14789== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==14789== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==14789== Command: ./brute_force
==14789==
dytz
mrdv
Distancia mínima: 6

EL tiempo de ejecucion en segundos es: 0.010875

El tiempo de ejecucion en microsegundos es: 10875

==14789==
==14789== HEAP SUMMARY:
==14789==   in use at exit: 0 bytes in 0 blocks
```

```
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_brute_force
==14789==   total heap usage: 71 allocs, 71 frees, 116,488 bytes allocated
==14789==
==14789== All heap blocks were freed -- no leaks are possible
==14789==
==14789== For lists of detected and suppressed errors, rerun with: -s
==14789== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_brute_force
valgrind --leak-check=yes ./brute_force
==14805== Memcheck, a memory error detector
==14805== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==14805== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==14805== Command: ./brute_force
==14805==
alevijs
qxtzsew
Distancia mínima: 12

EL tiempo de ejecucion en segundos es: 0.126635

El tiempo de ejecucion en microsegundos es: 126635

==14805==
==14805== HEAP SUMMARY:
==14805==   in use at exit: 0 bytes in 0 blocks
==14805==   total heap usage: 71 allocs, 71 frees, 116,494 bytes allocated
==14805==
==14805== All heap blocks were freed -- no leaks are possible
==14805==
==14805== For lists of detected and suppressed errors, rerun with: -s
==14805== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_brute_force
valgrind --leak-check=yes ./brute_force
==14834== Memcheck, a memory error detector
==14834== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==14834== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==14834== Command: ./brute_force
==14834==
tryhgxyeqw
yffdztnbzf
Distancia mínima: 18

EL tiempo de ejecucion en segundos es: 30.7877
```

```
yoyo@DESKTOP-U0ARGTD: /mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation
El tiempo de ejecucion en microsegundos es: 30787713

==14834==
==14834== HEAP SUMMARY:
==14834==   in use at exit: 0 bytes in 0 blocks
==14834== total heap usage: 71 allocs, 71 frees, 116,500 bytes allocated
==14834==
==14834== All heap blocks were freed -- no leaks are possible
==14834==
==14834== For lists of detected and suppressed errors, rerun with: -s
==14834== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_brute_force
valgrind --leak-check=yes ./brute_force
==15035== Memcheck, a memory error detector
==15035== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==15035== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==15035== Command: ./brute_force
==15035==
qxgluydcmkh
tzclzgmukkb
Distancia mínima: 16

El tiempo de ejecucion en segundos es: 52.9702

El tiempo de ejecucion en microsegundos es: 52970246

==15035==
==15035== HEAP SUMMARY:
==15035==   in use at exit: 0 bytes in 0 blocks
==15035== total heap usage: 71 allocs, 71 frees, 116,502 bytes allocated
==15035==
==15035== All heap blocks were freed -- no leaks are possible
==15035==
==15035== For lists of detected and suppressed errors, rerun with: -s
==15035== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$
```

## Dynamic Programming:

```

yoyo@DESKTOP-U0ARGTD: /mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_dynami
c_programming
valgrind --leak-check=yes ./dynamic_programming
==15661== Memcheck, a memory error detector
==15661== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==15661== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==15661== Command: ./dynamic_programming
==15661==
fm
ua
Distancia mínima: 4

El tiempo de ejecucion en segundos es: 0.017306

El tiempo de ejecucion en microsegundos es: 17306

==15661==
==15661== HEAP SUMMARY:
==15661==   in use at exit: 0 bytes in 0 blocks
==15661== total heap usage: 76 allocs, 76 frees, 116,604 bytes allocated
==15661==
==15661== All heap blocks were freed -- no leaks are possible
==15661==
==15661== For lists of detected and suppressed errors, rerun with: -s
==15661== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_dynami
c_programming
valgrind --leak-check=yes ./dynamic_programming
==15702== Memcheck, a memory error detector
==15702== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==15702== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==15702== Command: ./dynamic_programming
==15702==
dytz
mrdv
Distancia mínima: 6

El tiempo de ejecucion en segundos es: 0.021382

El tiempo de ejecucion en microsegundos es: 21382

==15702==
==15702== HEAP SUMMARY:
==15702==   in use at exit: 0 bytes in 0 blocks

```

```

yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_dynami
c_programming
valgrind --leak-check=yes ./dynamic_programming
==15748== Memcheck, a memory error detector
==15748== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==15748== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==15748== Command: ./dynamic_programming
==15748==
alevije
qxtzsew
Distancia mínima: 12

El tiempo de ejecucion en segundos es: 0.017786

El tiempo de ejecucion en microsegundos es: 17786

==15748==
==15748== HEAP SUMMARY:
==15748==   in use at exit: 0 bytes in 0 blocks
==15748== total heap usage: 81 allocs, 81 frees, 116,974 bytes allocated
==15748==
==15748== All heap blocks were freed -- no leaks are possible
==15748==
==15748== For lists of detected and suppressed errors, rerun with: -s
==15748== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
yoyo@DESKTOP-U0ARGTD:/mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_dynami
c_programming
valgrind --leak-check=yes ./dynamic_programming
==15780== Memcheck, a memory error detector
==15780== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==15780== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==15780== Command: ./dynamic_programming
==15780==
tryhgxyeqw
yffdztnbzf
Distancia mínima: 18

El tiempo de ejecucion en segundos es: 0.020954

```

```
yoyo@DESKTOP-U0ARGTD: /mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation
EL tiempo de ejecucion en segundos es: 0.020954
El tiempo de ejecucion en microsegundos es: 20954

==15780==
==15780== HEAP SUMMARY:
==15780==   in use at exit: 0 bytes in 0 blocks
==15780== total heap usage: 84 allocs, 84 frees, 117,292 bytes allocated
==15780==
==15780== All heap blocks were freed -- no leaks are possible
==15780==
==15780== For lists of detected and suppressed errors, rerun with: -s
==15780== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
yoyo@DESKTOP-U0ARGTD: /mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ make ejecutar_dynami
c_programming
valgrind --leak-check=yes ./dynamic_programming
==15812== Memcheck, a memory error detector
==15812== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==15812== Using Valgrind-3.18.1 and LibVEX; rerun with -h for copyright info
==15812== Command: ./dynamic_programming
==15812==
qxgluydcmkh
tzclzgmukkb
Distancia mínima: 16

EL tiempo de ejecucion en segundos es: 0.023006
El tiempo de ejecucion en microsegundos es: 23006

==15812==
==15812== HEAP SUMMARY:
==15812==   in use at exit: 0 bytes in 0 blocks
==15812== total heap usage: 85 allocs, 85 frees, 117,414 bytes allocated
==15812==
==15812== All heap blocks were freed -- no leaks are possible
==15812==
==15812== For lists of detected and suppressed errors, rerun with: -s
==15812== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
yoyo@DESKTOP-U0ARGTD: /mnt/c/Users/yoyo/OneDrive - Universidad Técnica Federico Santa María/Algoritmo y complejidad/Tareas/Tarea_2&3/Implementation$ _
```