

Local Alignment Document

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1. 수행시간 측정

측정방법

time 명령을 실행시 앞에 추가해 시간측정. Real time 기준으로 측정하며, 외부영향을 줄이기 위해 프로세스를 연달아 실행한다

```
sysprog@sysprog-VirtualBox:~/algo$ time ./a.out data/Test/TestDB.fa data/Test/TestQuery1.fa ./my_answers/
Opening Input Files...
  open data/Test/TestDB.fa
  name : >MT dna:chromosome chromosome:AnoCar2.0:MT:1:17223:1 REF
  read successfully

  open data/Test/TestQuery1.fa
  name : >ENST00000361739 ENSG00000198712 MT-CO2
  read successfully

Building Dynamic Algorithm Matrix...
Finding answer...
  total score : 1489      match : 483      mismatch : 189      gap : 17
  save file in ./my_answers/TestDBTestQuery1.txt

real    0m0.913s
user    0m0.894s
sys     0m0.012s
sysprog@sysprog-VirtualBox:~/algo$ time ./a.out data/Test/TestDB.fa data/Test/TestQuery2.fa ./my_answers/
Opening Input Files...
  open data/Test/TestDB.fa
  name : >MT dna:chromosome chromosome:AnoCar2.0:MT:1:17223:1 REF
  read successfully

  open data/Test/TestQuery2.fa
  name : >ENST00000361567 ENSG00000198786 MT-ND5
  read successfully

Building Dynamic Algorithm Matrix...
Finding answer...
  total score : 2832      match : 1158      mismatch : 542      gap : 79
  save file in ./my_answers/TestDBTestQuery2.txt

real    0m2.327s
user    0m2.246s
sys     0m0.068s
sysprog@sysprog-VirtualBox:~/algo$ time ./a.out data/Test/TestDB.fa data/Test/TestQuery3.fa ./my_answers/
Opening Input Files...
  open data/Test/TestDB.fa
  name : >MT dna:chromosome chromosome:AnoCar2.0:MT:1:17223:1 REF
  read successfully

  open data/Test/TestQuery3.fa
  name : >MT dna:chromosome chromosome:GRCz10:MT:1:16596:1 REF
  read successfully

Building Dynamic Algorithm Matrix...
Finding answer...
  total score : 25662      match : 8994      mismatch : 3642      gap : 474
  save file in ./my_answers/TestDBTestQuery3.txt

real    0m16.452s
user    0m15.833s
sys     0m0.498s
```

```

sysprog@sysprog-VirtualBox:~/algo$ time ./a.out data/Homo_sapiensMT.fa data/Danio_rerio.MT.fa ./my_answers/
Opening Input Files...
  open data/Homo_sapiensMT.fa
  name : >MT dna:chromosome chromosome:GRCh38:MT:1:16569:1 REF
  read successfully

  open data/Danio_rerio.MT.fa
  name : >MT dna:chromosome chromosome:GRCz10:MT:1:16596:1 REF
  read successfully

Building Dynamic Algorithm Matrix...
Finding answer...
total score : 27599      match : 10641   mismatch : 4524 gap : 751
save file in ./my_answers/Homo_sapiensMTDanio_rerio.txt

real    0m21.698s
user    0m19.702s
sys     0m1.957s
sysprog@sysprog-VirtualBox:~/algo$ time ./a.out data/Homo_sapiensMT.fa data/Mus_musculusMT.fa ./my_answers/
Opening Input Files...
  open data/Homo_sapiensMT.fa
  name : >MT dna:chromosome chromosome:GRCh38:MT:1:16569:1 REF
  read successfully

  open data/Mus_musculusMT.fa
  name : >MT dna:chromosome chromosome:GRCm38:MT:1:16299:1 REF
  read successfully

Building Dynamic Algorithm Matrix...
Finding answer...
total score : 37552      match : 11762   mismatch : 3877 gap : 575
save file in ./my_answers/Homo_sapiensMTMus_musculusMT.txt

real    0m19.171s
user    0m18.622s
sys     0m0.528s
sysprog@sysprog-VirtualBox:~/algo$ time ./a.out data/Danio_rerio.MT.fa data/Mus_musculusMT.fa ./my_answers/
Opening Input Files...
  open data/Danio_rerio.MT.fa
  name : >MT dna:chromosome chromosome:GRCz10:MT:1:16596:1 REF
  read successfully

  open data/Mus_musculusMT.fa
  name : >MT dna:chromosome chromosome:GRCm38:MT:1:16299:1 REF
  read successfully

Building Dynamic Algorithm Matrix...
Finding answer...
total score : 30060      match : 10916   mismatch : 4240 gap : 756
save file in ./my_answers/Danio_rerioMus_musculusMT.txt

real    0m19.272s
user    0m18.824s
sys     0m0.416s

```

database	시간(sec)
Test Query 1	0.9
Test Query 2	2.3
Test Query 3	16.5
Homo_sapience & Danio_rerio	19.2
Homo_sapience & Mus_musculus	21.7
Mus_musculus & Danio_rerio	19.3

2. 메모리 사용량 측정

측정방법

argv[4]로 "stop"입력 시 프로그램 중지

ps -ef 명령어로 프로세스 목록 열람, 그 중 Local Alignment 프로세스 이름으로 pid값 확인

cat /proc/[찾아낸 pid 값]/status 명령으로 Local Alignment 프로세스의 상세설명 확인

heap, stack 사용량에 해당되는 VmData, VmStk를 기준으로 비교

VmData: 46764 kB	VmData: 122672 kB	VmData: 872468 kB
VmStk: 132 kB	VmStk: 132 kB	VmStk: 132 kB
VmData: 1055812 kB	VmData: 1075028 kB	VmData: 1057532 kB
VmStk: 132 kB	VmStk: 132 kB	VmStk: 132 kB

Database	Heap사용량(KB)	Stack사용량(KB)
Test Query 1	46764	132
Test Query 2	112672	132
Test Query 3	872468	132
Homo_sapience & Danio_rerio	1075028	132
Homo_sapience & Mus_musculus	1055812	132
Mus_musculus & Danio_rerio	1057532	132

3. 실행결과

Score

database	Total score	Match	Mismatch	Gap
Test Query 1	1489	483	189	17
Test Query 2	2832	1158	542	79
Test Query 3	25662	8994	3642	474
Homo_sapience & Danio_rerio	27599	10641	4524	751
Homo_sapience & Mus_musculus	37552	11762	3877	575
Mus_musculus & Danio_rerio	30060	10916	4240	756

실행결과 생성된 파일은 따로 첨부