

## Лабораторна робота 2b

“Автоматичний режим “benchmark” з вимірами ефективності роботи різних механізмів зберігання”

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ІПС-11

### Завдання 21

#### 1) Геометрична прогресія

```
Input mode of work
i - interactive
d - demonstration
b - benchmark
b
Enter count of relation: 10
Time taken by List A GENERATE AND PUSH*5: 0 milliseconds
Time taken by List B GENERATE AND PUSH*5: 0 milliseconds
Time taken by UNION5: 0 milliseconds
Time taken by INTERSECTION5: 0 milliseconds
Time taken by TOTAL: 0 milliseconds

MEMORY USED BY LIST: 120 bytes

PS D:\Programing\GitHub\University\First-Year> |
```

```
Input mode of work
i - interactive
d - demonstration
b - benchmark
b
Enter count of relation: 100
Time taken by List A GENERATE AND PUSH*50: 0 milliseconds
Time taken by List B GENERATE AND PUSH*50: 0 milliseconds
Time taken by UNION50: 0 milliseconds
Time taken by INTERSECTION50: 0 milliseconds
Time taken by TOTAL: 0 milliseconds

MEMORY USED BY LIST: 1200 bytes

PS D:\Programing\GitHub\University\First-Year> |
```

```
Input mode of work
i - interactive
d - demonstration
b - benchmark
b
Enter count of relation: 1000
Time taken by List A GENERATE AND PUSH*500: 0 milliseconds
Time taken by List B GENERATE AND PUSH*500: 0 milliseconds
Time taken by UNION500: 2 milliseconds
Time taken by INTERSECTION500: 0 milliseconds
Time taken by TOTAL: 4 milliseconds

MEMORY USED BY LIST: 11544 bytes

PS D:\Programing\GitHub\University\First-Year> |
```

```
Input mode of work
i - interactive
d - demonstration
b - benchmark
b
Enter count of relation: 10000
Time taken by List A GENERATE AND PUSH*5000: 37 milliseconds
Time taken by List B GENERATE AND PUSH*5000: 35 milliseconds
Time taken by UNION5000: 136 milliseconds
Time taken by INTERSECTION5000: 52 milliseconds
Time taken by TOTAL: 265 milliseconds

MEMORY USED BY LIST: 94416 bytes

PS D:\Programing\GitHub\University\First-Year> |
```

```
Input mode of work
i - interactive
d - demonstration
b - benchmark
b
Enter count of relation: 35000
Time taken by List A GENERATE AND PUSH*17500: 236 milliseconds
Time taken by List B GENERATE AND PUSH*17500: 238 milliseconds
Time taken by UNION17500: 305 milliseconds
Time taken by INTERSECTION17500: 238 milliseconds
Time taken by TOTAL: 1021 milliseconds

MEMORY USED BY LIST: 198360 bytes

PS D:\Programing\GitHub\University\First-Year> |
```

```
Input mode of work
i - interactive
d - demonstration
b - benchmark
b
Enter count of relation: 50000
Time taken by List A GENERATE AND PUSH*25000: 380 milliseconds
Time taken by List B GENERATE AND PUSH*25000: 374 milliseconds
Time taken by UNION25000: 313 milliseconds
Time taken by INTERSECTION25000: 315 milliseconds
Time taken by TOTAL: 1386 milliseconds

MEMORY USED BY LIST: 219984 bytes

PS D:\Programing\GitHub\University\First-Year> |
```

Тобто 35000 елементів генеруються та виконуються дії за за 1 секунду

## 2) Арифметична прогресія (>1с)

```
Input mode of work
i - interactive
d - demonstration
b - benchmark
b
Enter count of relation: 80000
Time taken by List A GENERATE AND PUSH*40000: 655 milliseconds
Time taken by List B GENERATE AND PUSH*40000: 677 milliseconds
Time taken by UNION*40000: 366 milliseconds
Time taken by INTERSECTION*40000: 375 milliseconds
Time taken by TOTAL: 2077 milliseconds

MEMORY USED BY LIST: 235152 bytes

PS D:\Programing\GitHub\University\First-Year> |
```

```
Input mode of work
i - interactive
d - demonstration
b - benchmark
b
Enter count of relation: 130000
Time taken by List A GENERATE AND PUSH*65000: 1167 milliseconds
Time taken by List B GENERATE AND PUSH*65000: 1129 milliseconds
Time taken by UNION*65000: 369 milliseconds
Time taken by INTERSECTION*65000: 366 milliseconds
Time taken by TOTAL: 3034 milliseconds

MEMORY USED BY LIST: 239520 bytes

PS D:\Programing\GitHub\University\First-Year> |
```

```
Input mode of work
i - interactive
d - demonstration
b - benchmark
b
Enter count of relation: 180000
Time taken by List A GENERATE AND PUSH*90000: 1652 milliseconds
Time taken by List B GENERATE AND PUSH*90000: 1677 milliseconds
Time taken by UNION*90000: 358 milliseconds
Time taken by INTERSECTION*90000: 422 milliseconds
Time taken by TOTAL: 4112 milliseconds

MEMORY USED BY LIST: 239976 bytes

PS D:\Programing\GitHub\University\First-Year> |
```

```
Input mode of work
i - interactive
d - demonstration
b - benchmark
b
Enter count of relation: 230000
Time taken by List A GENERATE AND PUSH*115000: 2102 milliseconds
Time taken by List B GENERATE AND PUSH*115000: 2170 milliseconds
Time taken by UNION*115000: 368 milliseconds
Time taken by INTERSECTION*115000: 417 milliseconds
Time taken by TOTAL: 5060 milliseconds

MEMORY USED BY LIST: 240000 bytes

PS D:\Programing\GitHub\University\First-Year> |
```

```
Input mode of work
i - interactive
d - demonstration
b - benchmark
b
Enter count of relation: 280000
Time taken by List A GENERATE AND PUSH*140000: 2575 milliseconds
Time taken by List B GENERATE AND PUSH*140000: 2555 milliseconds
Time taken by UNION*140000: 369 milliseconds
Time taken by INTERSECTION*140000: 413 milliseconds
Time taken by TOTAL: 5916 milliseconds

MEMORY USED BY LIST: 240000 bytes

PS D:\Programing\GitHub\University\First-Year> |
```

```
Input mode of work
i - interactive
d - demonstration
b - benchmark
b
Enter count of relation: 340000
Time taken by List A GENERATE AND PUSH*170000: 3139 milliseconds
Time taken by List B GENERATE AND PUSH*170000: 3180 milliseconds
Time taken by UNION*170000: 329 milliseconds
Time taken by INTERSECTION*170000: 408 milliseconds
Time taken by TOTAL: 7060 milliseconds

MEMORY USED BY LIST: 240000 bytes

PS D:\Programing\GitHub\University\First-Year> |
```

```
Input mode of work
i - interactive
d - demonstration
b - benchmark
b
Enter count of relation: 400000
Time taken by List A GENERATE AND PUSH*200000: 3699 milliseconds
Time taken by List B GENERATE AND PUSH*200000: 3754 milliseconds
Time taken by UNION*200000: 341 milliseconds
Time taken by INTERSECTION*200000: 419 milliseconds
Time taken by TOTAL: 8216 milliseconds

MEMORY USED BY LIST: 240000 bytes

PS D:\Programing\GitHub\University\First-Year> |
```

```
Input mode of work
i - interactive
d - demonstration
b - benchmark
b
Enter count of relation: 450000
Time taken by List A GENERATE AND PUSH*225000: 4208 milliseconds
Time taken by List B GENERATE AND PUSH*225000: 4248 milliseconds
Time taken by UNION*225000: 362 milliseconds
Time taken by INTERSECTION*225000: 390 milliseconds
Time taken by TOTAL: 9211 milliseconds

MEMORY USED BY LIST: 240000 bytes

PS D:\Programing\GitHub\University\First-Year> |
```

```
Input mode of work
i - interactive
d - demonstration
b - benchmark
b
Enter count of relation: 500000
Time taken by List A GENERATE AND PUSH*250000: 4669 milliseconds
Time taken by List B GENERATE AND PUSH*250000: 4622 milliseconds
Time taken by UNION*250000: 364 milliseconds
Time taken by INTERSECTION*250000: 417 milliseconds
Time taken by TOTAL: 10076 milliseconds

MEMORY USED BY LIST: 240000 bytes

PS D:\Programing\GitHub\University\First-Year> |
```

## Завдання 25

### 1) Геометрична прогресія

```
Input mode of work
i - interactive
d - demonstration
b - benchmark
Please, write the character of your request: b
Enter count of elements: 10
Time taken by GENERATE AND PUSH*10: 0 milliseconds
Time taken by SEARCH: 0 milliseconds
Time taken by DELETE10: 0 milliseconds
Time taken by TOTAL: 2 milliseconds

MEMORY USED BY LIST: 1084 bytes
```

```
Input mode of work
i - interactive
d - demonstration
b - benchmark
Please, write the character of your request: b
Enter count of elements: 100
Time taken by GENERATE AND PUSH*100: 0 milliseconds
Time taken by SEARCH: 0 milliseconds
Time taken by DELETE100: 0 milliseconds
Time taken by TOTAL: 3 milliseconds

MEMORY USED BY LIST: 6284 bytes
```

```
Input mode of work
i - interactive
d - demonstration
b - benchmark
Please, write the character of your request: b
Enter count of elements: 1000
Time taken by GENERATE AND PUSH*1000: 0 milliseconds
Time taken by SEARCH: 0 milliseconds
Time taken by DELETE1000: 0 milliseconds
Time taken by TOTAL: 2 milliseconds

MEMORY USED BY LIST: 10340 bytes
```

```
Input mode of work
i - interactive
d - demonstration
b - benchmark
Please, write the character of your request: b
Enter count of elements: 10000
Time taken by GENERATE AND PUSH*10000: 1 milliseconds
Time taken by SEARCH: 0 milliseconds
Time taken by DELETE10000: 0 milliseconds
Time taken by TOTAL: 4 milliseconds

MEMORY USED BY LIST: 10340 bytes
```

```
Input mode of work
i - interactive
d - demonstration
b - benchmark
Please, write the character of your request: b
Enter count of elements: 100000
Time taken by GENERATE AND PUSH*100000: 16 milliseconds
Time taken by SEARCH: 0 milliseconds
Time taken by DELETE100000: 0 milliseconds
Time taken by TOTAL: 18 milliseconds

MEMORY USED BY LIST: 10340 bytes
```

```
Input mode of work
i - interactive
d - demonstration
b - benchmark
Please, write the character of your request: b
Enter count of elements: 1000000
Time taken by GENERATE AND PUSH*1000000: 151 milliseconds
Time taken by SEARCH: 0 milliseconds
Time taken by DELETE1000000: 0 milliseconds
Time taken by TOTAL: 153 milliseconds

MEMORY USED BY LIST: 10340 bytes
```

```
Input mode of work
i - interactive
d - demonstration
b - benchmark
Please, write the character of your request: b
Enter count of elements: 10000000
Time taken by GENERATE AND PUSH*10000000: 1261 milliseconds
Time taken by SEARCH: 0 milliseconds
Time taken by DELETE10000000: 0 milliseconds
Time taken by TOTAL: 1262 milliseconds

MEMORY USED BY LIST: 10340 bytes
```

### 2) Арифметична прогресія (>1с)

```
Input mode of work
i - interactive
d - demonstration
b - benchmark
Please, write the character of your request: b
Enter count of elements: 100000000
Time taken by GENERATE AND PUSH*100000000: 12842 milliseconds
Time taken by SEARCH: 0 milliseconds
Time taken by DELETE100000000: 0 milliseconds
Time taken by TOTAL: 12843 milliseconds

MEMORY USED BY LIST: 10340 bytes
```

Висновок: У задачі про бінарні відношення моя реалізація доходить до 10 секунд приблизно при 500 тисячах, а в задачі там де реалізований Skip List та сама межа доходить при  $10^8$