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The author gratefully acknowledges support from the taxpayers of Québec and of Canada who have paid his salary and research grants while this work was developed at McGill University, and from his students (who built the implementations and investigated the data structures and algorithms) and their funding agencies.

T. H. Merrett
## Searching Sequential Files

<table>
<thead>
<tr>
<th></th>
<th>Successful</th>
<th>Unsuccessful</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordered</td>
<td>$\frac{n}{2}$</td>
<td>$\frac{n}{2}$</td>
</tr>
<tr>
<td>Unordered</td>
<td>$\frac{n}{2}$</td>
<td>$n$</td>
</tr>
</tbody>
</table>

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Merging Sequential Files

1. Union

(read file 1
read file 2

1< 2<

1:2 =

Y stop

N

write file 1
write file 1|2
write file 2

read file 1
read file 1
read file 2

read file 1
read file 2

(read file .. means read a record, return $\infty$ at EOF;
“1:2” means compare key fields;
“1<” means key of file 1 is low)

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2. Intersection

read file 1
read file 2

1< 1:2 2<

= Y stop
N

write file 1|2
read file 1
read file 2
read file 1
read file 2

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3. Difference

```plaintext
read file 1
read file 2

1< 1:2 ≥ 2<

=

Y stop
N

write file 1
read file 1

read file 1
read file 1

read file 1
read file 2

read file 2
```
4. Update (2 with 1)
Sorting Sequential Files

1. Initial Runs

\[ r = \frac{N}{2F}, F \text{ records in RAM} \]

2. Merge

\[ 1 + \log_f r \text{ read passes} \]

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The Snowplough Argument