

Analysis

System Configuration:

```
hofund@smartfridge
-----
OS: Arch Linux x86_64
Host: Inspiron 15-3567
Kernel: 5.11.6-arch1-1
Uptime: 5 days, 57 mins
Packages: 1648 (pacman), 14 (flatpak)
Shell: zsh 5.8
Resolution: 1366x768
DE: GNOME 3.38.3
WM: Mutter
WM Theme: Materia-dark-compact
Theme: Materia-dark [GTK2/3]
Icons: Papyrus [GTK2/3]
Terminal: gnome-terminal
CPU: Intel i5-7200U (4) @ 3.100GHz
GPU: AMD ATI Radeon HD 8670A/8670M/869
GPU: Intel HD Graphics 620
Memory: 7361MiB / 11841MiB
```

INPUT FILES:

- INPUTR = 5000 records
- INPUTS = 5000 records

OUTPUT FILE:

- INPUTR_INPUTS_join.txt

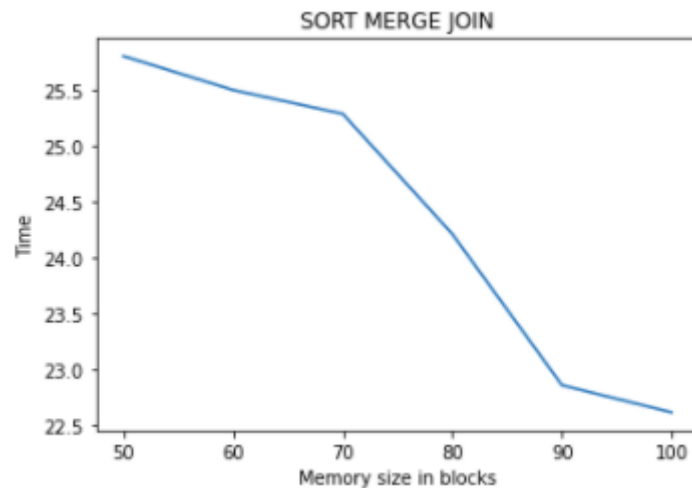
Sort Merge Join:

In sort merge phase 1 of K-way merge sort was implemented to create the sorted subfiles then from the min heap the min value was taken to compute the join.

Bottleneck condition: $B(R) + B(S) < M^2$

Memory(in blocks)	Time(in seconds)
50	25.8092839717865
60	25.505856037139893
70	25.292759895324707

80	24.216477155685425
90	22.863887548446655
100	22.621471166610718



Hash Join:

Universal hash was implemented to calculate the hash for the column used for join i.e. Y. After calculation of hash value for the Y attribute sublists were created according to the hash values. With the sublist join record were printed to the file that matched in both R and S

Bottleneck condition: $\min(B(R), B(S)) < M$

Memory(in blocks)	Time (in seconds)
50	36.126182317733765
60	33.504706621170044
70	33.212961196899414
80	33.17282032966614
90	32.327133893966675
100	31.954663276672363

