**Cache Simulation**

1. Block Size Trade Off

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Miss Rate using Direct Mapped** | | | | | | | | |
| Block Size (Bytes) | Cache Size (KB) | | | | | | | |
| GCC | | | | Go | | | |
| 4 | 8 | 16 | 32 | 4 | 8 | 16 | 32 |
| 4 | 0.165 | 0.112 | 0.075 | 0.052 | 0.103 | 0.065 | 0.039 | 0.022 |
| 8 | 0.174 | 0.117 | 0.077 | 0.052 | 0.117 | 0.067 | 0.039 | 0.021 |
| 16 | 0.161 | 0.108 | 0.070 | 0.047 | 0.132 | 0.073 | 0.040 | 0.020 |
| 32 | 0.156 | 0.103 | 0.066 | 0.044 | 0.165 | 0.090 | 0.046 | 0.022 |

1. Replacement Algorithm

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Miss Rate using Replacement Algorithm** | | | | | | | | |
| Cache Size (KB) | Associativity | | | | | | | |
| GCC | | | | Go | | | |
| Two-way | | Four-way | | Two-way | | Four-way | |
| LRU | RR | LRU | RR | LRU | RR | LRU | RR |
| 4 | 0.130 | 0.104 | 0.120 | 0.091 | 0.066 | 0.066 | 0.052 | 0.052 |
| 8 | 0.089 | 0.068 | 0.083 | 0.062 | 0.040 | 0.040 | 0.034 | 0.034 |
| 16 | 0.055 | 0.042 | 0.050 | 0.039 | 0.025 | 0.025 | 0.023 | 0.023 |
| 32 | 0.033 | 0.025 | 0.028 | 0.022 | 0.015 | 0.015 | 0.014 | 0.014 |