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Hash Table Code

Assumptions

1. 1 KB F. A. data cache
2. 16 byte cache line
3. 100 cycle miss penalty
4. sizeof (Element) = 16 bytes
5. *Element = 8 bytes
6. N_ELEMENTS > 1024

```
1  Element element[N_ELEMENTS], *bucket[1024]
2  for (i = 0; i < N_ELEMENTS; i++)
   {
3    Element *ptrCurr, **ptrUpdate;
4    int hash_index;

     /* Find the location at which the new element is to be inserted. */
5    hash_index = element[i].value & 1023;
6    ptrUpdate = &bucket[hash_index];
7    ptrCurr = bucket[hash_index];
     /* Find the place in the chain to insert the new element. */
8    while (ptrCurr && ptrCurr->value <= element[i].value)
9    {
10     ptrUpdate = &ptrCurr->next;
11     ptrCurr = ptrCurr->next;
     }
     /* Update pointers to insert the new element into the chain. */
12   element[i].next = *ptrUpdate;
13   *ptrUpdate = &element[i];
   }
```

Explain how you would use architectural/software techniques to run this code as fast as possible