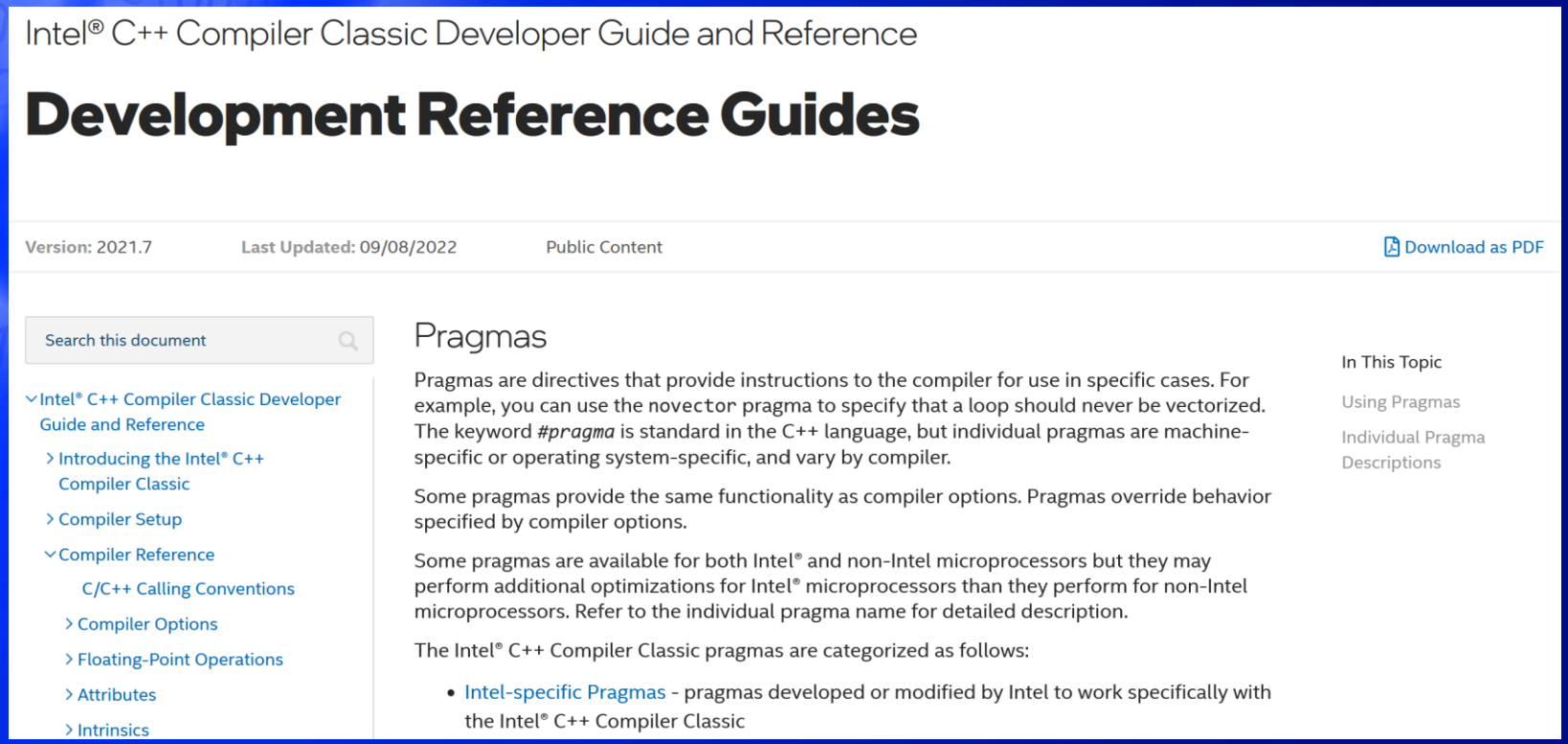
Workload Analysis

(Stage 3)

Compiler Directive (Pragma)

- 嘗試使用compiler directive (pragma)，協助compiler做更好的決定、獲得更好的優化效果。
- https://www.intel.com/content/www/us/en/develop/documentation/cpp-compiler-developer-guide-and-reference/top/compiler-reference/pragmas.html



unroll / nounroll

- Tells the compiler to unroll or not to unroll a counted loop.

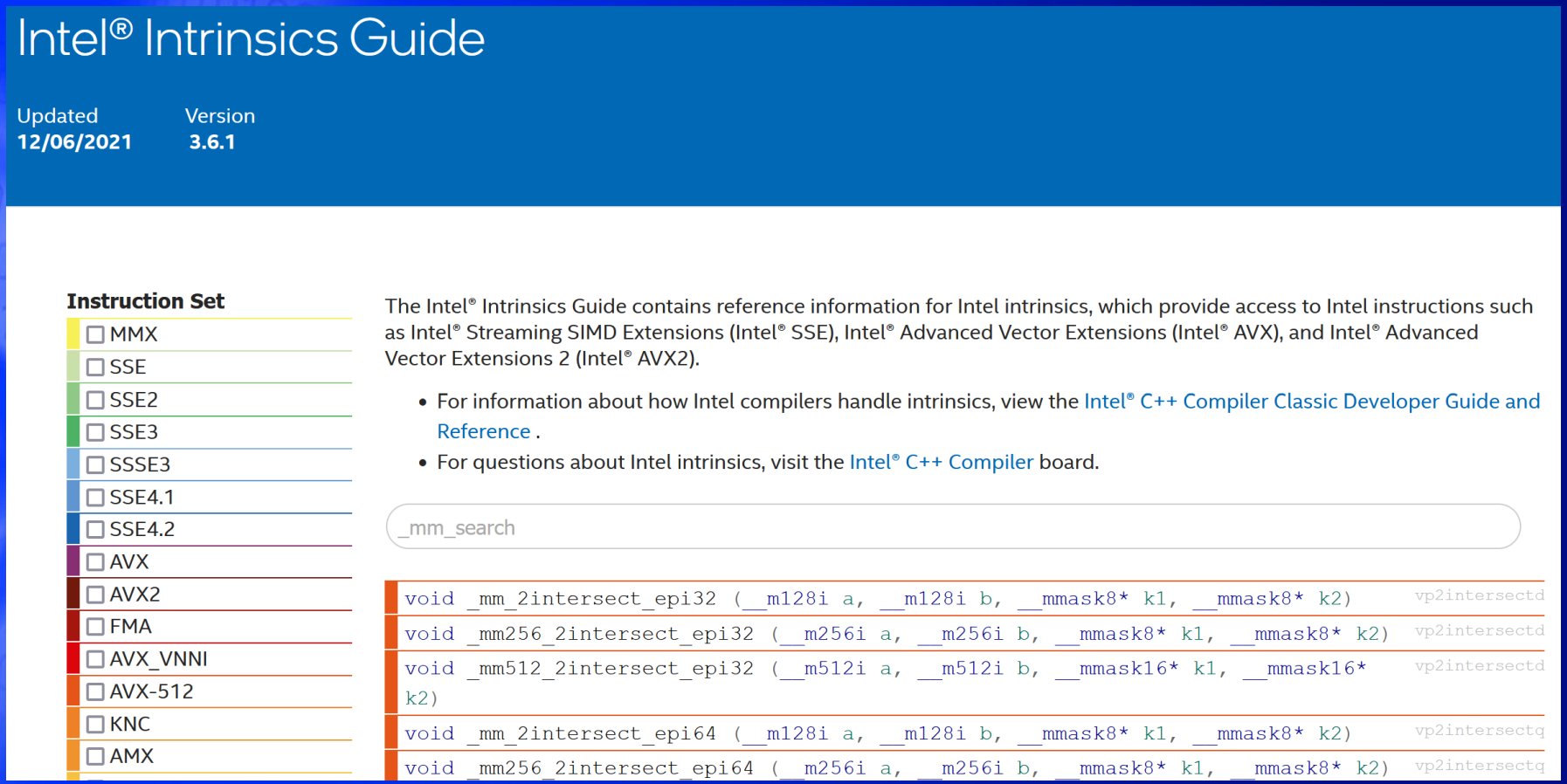
Use the *unroll* pragma for innermost loop unrolling:

```
1  void unroll(int a[], int b[], int c[], int d[]) {
2    #pragma unroll(4)
3    for (int i = 1; i < 100; i++) {
4      b[i] = a[i] + 1;
5      d[i] = c[i] + 1;
6    }
7  }
```

其他注意事項

- 盡量專注於某一個版本為基礎，做程式碼的分析與修改
- 嘗試使用SIMD的方式加速程式執行的效能
  - OpenMP directive (OpenMP writing)
  - SIMD intrinsic function
  - Function inlining
  - Loop unrolling
  - A specialized function instead of the original version. (ex: Intel math kernel library, MKL)
  - Profile-guided optimization
  - Thread binding to CPU core
  - Others …

SIMD Intrinsic Functions



https://www.intel.com/content/www/us/en/docs/intrinsics-guide/index.html

其他注意事項 (2)

- 若報告投影片有程式碼/圖表，請確認投影出來是清楚的，以利說明
- 請思考如何呈現你的數據，讓聽眾可以更清楚的了解你的想法與結果

Presentation

- 口頭報告
  - workload program簡介
  - 嘗試修改的方法與結果 (結果好或壞不是最重要，最重要是需要知道為什麼好或為什麼不好)
  - 每組報告時間約10~15分鐘
  - Deadline: January 2, 2024 (面授，創新大樓R322)
- 完整書面報告
  - Deadline: January 5, 2024 (WORD, PDF, MarkDown)