CS494 -- Lab 5: SIMD

- CS494
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- This file: **http://web.eecs.utk.edu/~jplank/plank/classes/cs494/Labs/Lab-5-SIMD**
- Lab Directory: **/home/plank/cs494/Labs/Lab-5-SIMD**

Another simple lab writup. Write two programs:

- **The-Tips-Floyd-Bits-Packed-SIMD.cpp** -- This implements the **TheTips** class defined in **The-Tips.h**:

```
class TheTips {
  public:
    double solve(vector <string> clues, vector <int> probability, int print);
};
```

  You should implement this class as described in the Floyd-Warshall lecture notes, by packing the matrix into bits, and then using **_mm_or_si128()**.

- **AP-Flow-SIMD.cpp** -- This implements the **APFlow** class, defined in **AP-Flow.h**:

```
class APFlow {
  public:
    int N;
    uint8_t *Adj;
    uint8_t *Flow;
    void CalcFlow();
};
```

  You should also do this as described in the Floyd-Warshall lecture notes, by using the SIMD intrinsics **_mm_set1_epi8()**, **_mm_min_epu8()** and **_mm_max_epu8()**.

There is a makefile in this directory, plus header files and **Main** files (plus **MOA.h** and **MOA.c**). Copy these over and use them, but you may not modify them. When you submit, you should only sumbit **The-Tips-Floyd-Bits-Packed-SIMD.cpp** and **AP-Flow-SIMD.cpp**. Your teaching assistant will compile them with the makefile and the versions of **MOA.h**, **MOA.c**, **The-Tips.h**, **The-Tips-Main.cpp**, **AP-Flow.h** and **AP-Flow-Main.cpp** that are in this lab directory.

*In particular, do not use the versions of **The-Tips-Main.cpp** and **AP-Flow-Main.cpp** that are in the Floyd-Warshall lecture notes, as they are different from these versions. These versions have added a timeout after 4 seconds.*

Your TA will inspect your code to make sure that it is using SIMD correctly. The gradescripts will timeout and call your programs incorrect if they take longer than 4 seconds.

Have fun! After doing this lab, you get to put "Intel SIMD Extensions" onto your resume. You're welcome.