How could each program below be optimized?

```
01 int minf(int a, int b) {
02   int min = INT_MIN;
03   if (b > a) {
04     min = a;
05   } else {
06     min = b;
07   }
08   return min;
09 }
```

Figure 1

```
01 void foo(int *v, int N, int a, int b) {
02   printf(“Consider: %d\n", a * b);
03   for (int i = 0; i < N; i++) {
04     int x = v[i];
05     if (x < a * b) {
06       printf("Neg = %d\n", x);
07     }
08   }
09 }
```

Figure 2

```
01 void foo(int *v, int N, int a, int b) {
02   for (int i = 0; i < N; i++) {
03     int x = v[i];
04     if (x < a * b) {
05       printf("Neg = %d\n", x);
06     }
07   }
08   printf(“Considered: %d\n", a * b);
09 }
```

Figure 3

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1. Which information would you need to carry out the proposed optimization (automatically, I mean) in each one of these three examples?

2. Is the optimization the same for each example?

3. Is your optimization always performance-safe? By performance safe I mean to say: could it be the case that, for some specific inputs, the optimized program would run slower than the original program?