For the following code, identify and describe the race condition. How would you protect this race condition if parallelizing the loop in OpenMP

```
int main(int argc, char ** argv) {
    int i;
    int sum = 0;
    for(i=0;i<100;i++) {
        sum += i;
    }
    printf("sum = %d\n",sum);
}
```

For the following code, identify and describe the loop carried dependency.

```
#define N 10

int main(int argc, char ** argv) {
    int i;
    int fib[N];

    fib[0] = 1;
    fib[1] = 2;

    for(i=2;i<N;i++) {
        fib[i]=fib[i-1]+fib[i-2];
    }
    printf("fib[N-1] = %d\n",fib[N-1]);
}
```

The Ensemble Based Simulated Annealing (EBSA) Algorithm is modified to avoid a loop carried dependency by replacing one annealer taking many steps with many annealers taking fewer steps. Describe how this makes EBSA a different algorithm from SA.