debug-info-for-profiling

Introduction

Automatic Feedback Directed Optimization (AFDO) is a method for using sampling based profiles to guide optimizations. This is contrasted with other methods of FDO or profile-guided optimization (PGO) which use instrumented profiling.

Unlike PGO (controlled by the `rustc` flags `-Cprofile-generate` and `-Cprofile-use`), a binary being profiled does not perform significantly worse, and thus it's possible to profile binaries used in real workflows and not necessary to construct artificial workflows.

Use

In order to use AFDO, the target platform must be Linux running on an `x86_64` architecture with the performance profiler `perf` available. In addition, the external tool `create_llvm_prof` from this repository must be used.

Given a Rust file `main.rs`, we can produce an optimized binary as follows:

```
rustc -O -Zdebug-info-for-profiling main.rs -o main
perf record -b ./main
create_llvm_prof --binary=main --out=code.prof
rustc -O -Zprofile-sample-use=code.prof main.rs -o main2
```

The `perf` command produces a profile `perf.data`, which is then used by the `create_llvm_prof` command to create `code.prof`. This final profile is then used by `rustc` to guide optimizations in producing the binary `main2`.