
AdaCore

Structuring Your Application Lab

- Source is included in folder `040_structuring_your_application`
- **Very** simplistic speed monitor
 - Reads current distance
 - Determines amount of time since last read
 - Calculates speed
 - Sends message
- Four subsystems
 - Base - types and speed calculator
 - Sensors - reads distance from some register
 - Messages - sends message to some memory location
 - Application - main program
- We could build one GPR file and point to all source directories
 - But as our application grew, this would become harder to maintain

Assignment Part One

1. Build GPR files for each subsystem
 - Hint: These subsystems *depend* on each other, they do not *override* source files
 - As you build each GPR file, run `gprbuild -P <gpr file>` to make sure everything works
 - Main program is in `main.adb`
2. Run `main`
 - This will fail (leading up to Part Two of the assignment)
3. Modify `base_types.ads`
 - Just so source code needs to be compiled
4. Rebuild your main program
 - Even though the modified source file is not directly referenced in the main GPR file, `gprbuild` should compile everything it needs

Assignment Part One - Solution

```
with "../base/base.gpr";
with "../messages/messages.gpr";
with "../sensors/sensors.gpr";
project Application is
  for Source_Dirs use ("src");
  for Object_Dir use "obj";
  for Main use ("main.adb") & project'Main;
end Application;

with "../base/base.gpr";
project Messages is
  for Source_Dirs use ("src");
  for Object_Dir use "obj";
end Messages;

with "../base/base.gpr";
project Sensors is
  for Source_Dirs use ("src");
  for Object_Dir use "obj";
end Sensors;

project Base is
  for Source_Dirs use ("src");
  for Object_Dir use "obj";
end Base;
```

Assignment Part Two

1. Build GPR files to create test stubs for Odometer and Sender
 - Test bodies exist in the appropriate test subfolders
 - Create extensions for messages.gpr and sensors.gpr
 - We want to inherit the package spec, but use the "test" package bodies
2. Build a GPR file for the main application
 - Main still works, we just need the GPR file to access our stubs
 - We could create a new GPR file, or extend the original. Which is easier?
3. Build and run your main program

Assignment Part Two - Solution

- messages/test directory

```
project Messages_Test extends "../Messages.gpr" is
  for Source_Dirs use (".");
end Messages_Test;
```

- sensors/test directory

```
project Sensors_Test extends "../sensors.gpr" is
  for Source_Dirs use (".");
end Sensors_Test;
```

- test directory

```
with "../messages/test/messages_test.gpr";
with "../sensors/test/sensors_test.gpr";
project Test extends "../application/application.gpr" is
  for Main use ("main.adb") & project'Main;
end Test;
```