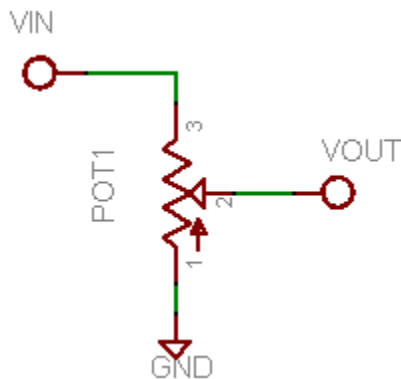


TECH 4243

Lab #2

Ver 1.0

Use a potentiometer circuit as follows (with VIN = 5v, GND = ground and Vout connected to ADC0)



Part A: Write a program that will read ADC0, scale it back to voltage and then display the voltage to the terminal window (Don't forget to add usart to project) as follows:

Input voltage = 4.323v

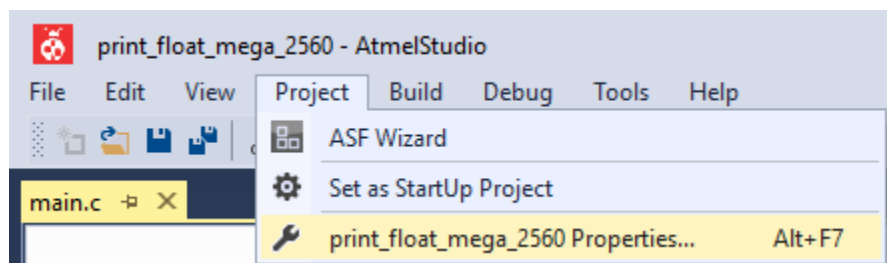
Input voltage = 4.32V

etc

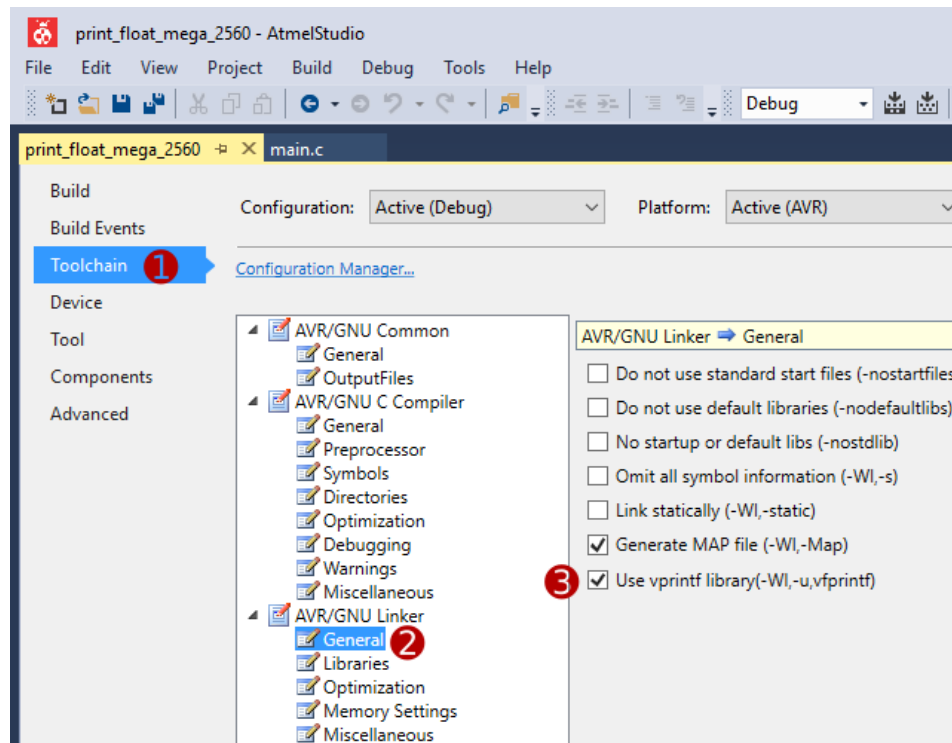
Since the voltage to be displayed will be a floating point number, you MUST tell the compiler to enable the floating point printf.

To do so do the following (from <https://startingelectronics.org/articles/atmel-AVR-8-bit/print-float-atmel-studio-7/>)

In Atmel Studio 7 on the top menu, click **Project** → **<project name> Properties...** to bring up the properties page for the currently open project. The image below shows the menu in Atmel Studio 7 for a project named **print_float_mega_2560**.

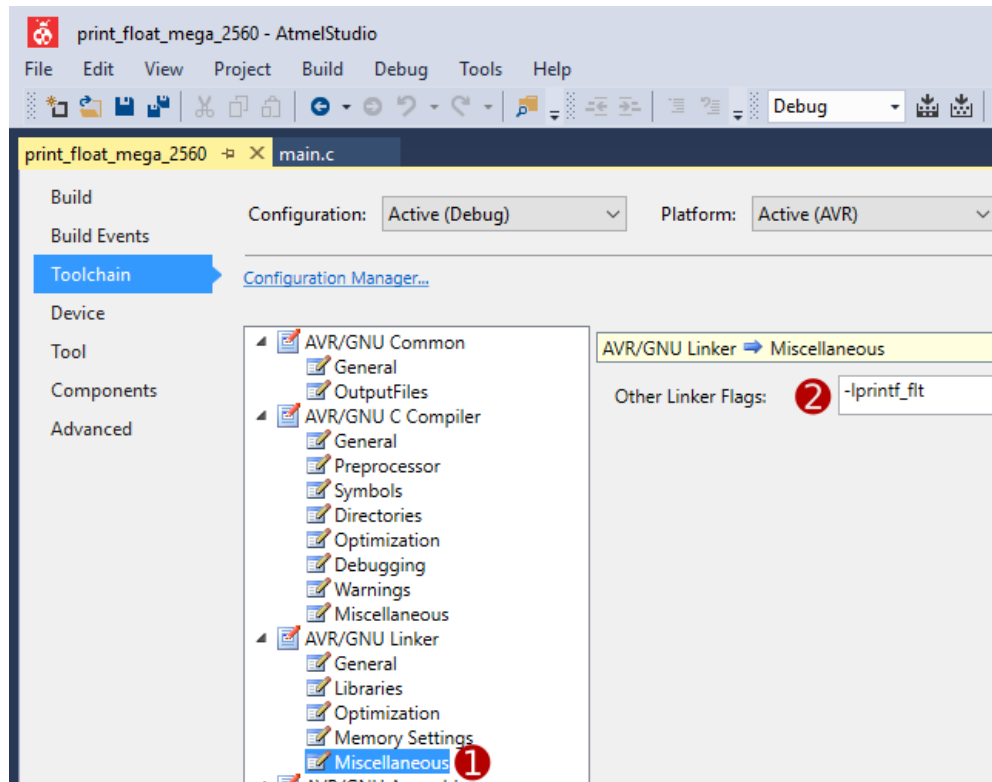


Click **Toolchain** in the page at the left of the project properties page and then **General** under the **AVR/GNU Linker** item as shown in the image below. Finally check the **Use vprintf library(-Wl,-u,vprintf)**.



Now click **Miscellaneous** under the **AVR/GNU Linker** item and add the following in the **Other Linker Flags** box as shown in the following image.

```
-lprintfflt
```



Save the changes to the linker options (Ctrl + S) and then rebuild the project. Projects that use `sprintf` and `printf` type functions should now be able to print floating point numbers to strings or standard output.

Part B: add 3 LED's (connected to pins of your choosing) so that the LED's turn on as follows:

- LED 1 turns on when the voltage of the pot output is $> 3V$
- LED 2 turns on when the voltage of the pot is in the range of $3V < V_{out} > 1V$
- LED 3 turns on when the voltage of the pot is $< 1V$