Arduino format double to string

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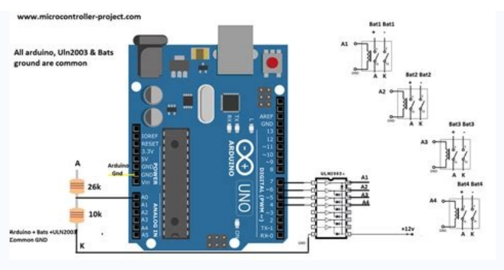
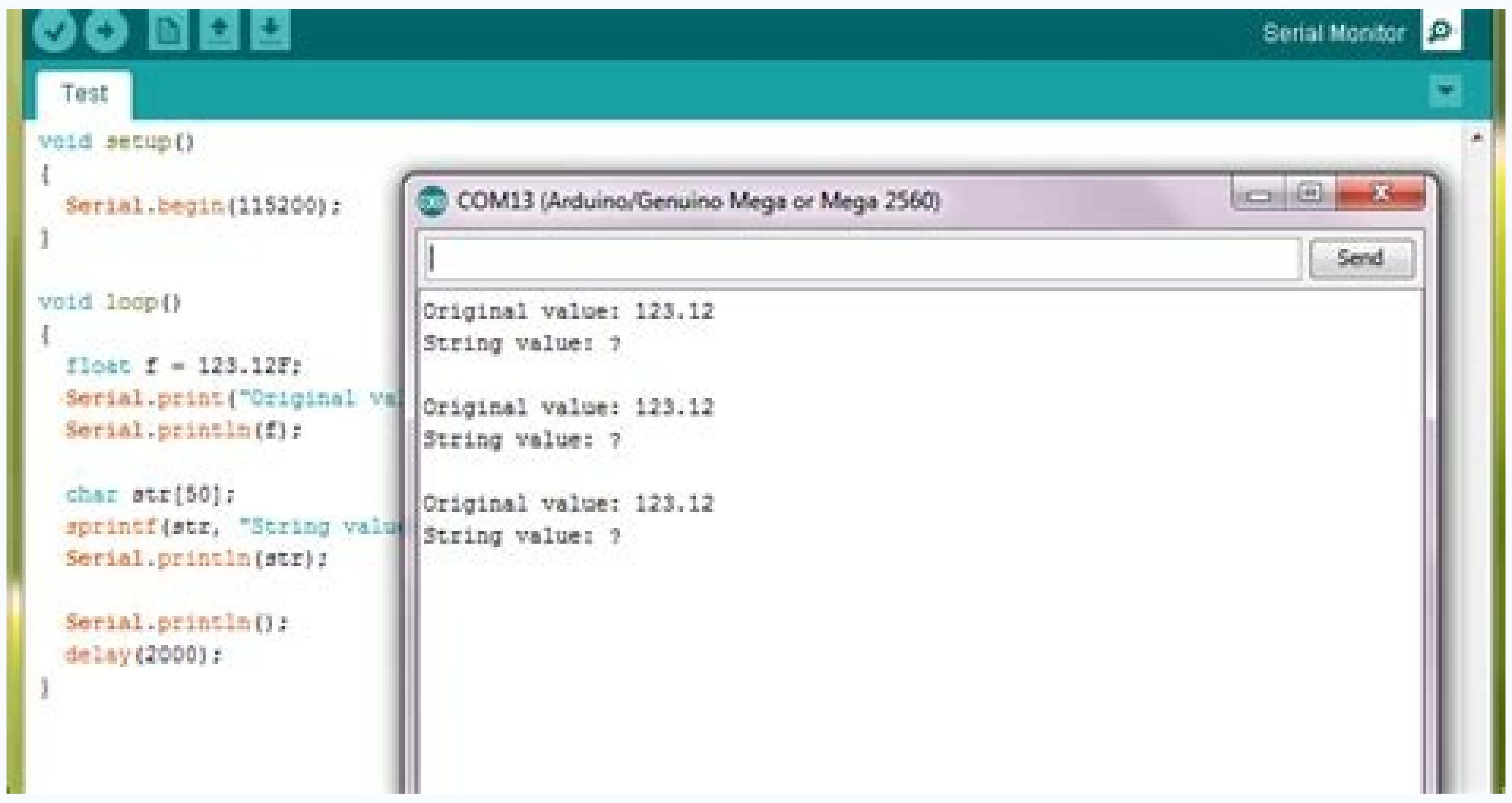
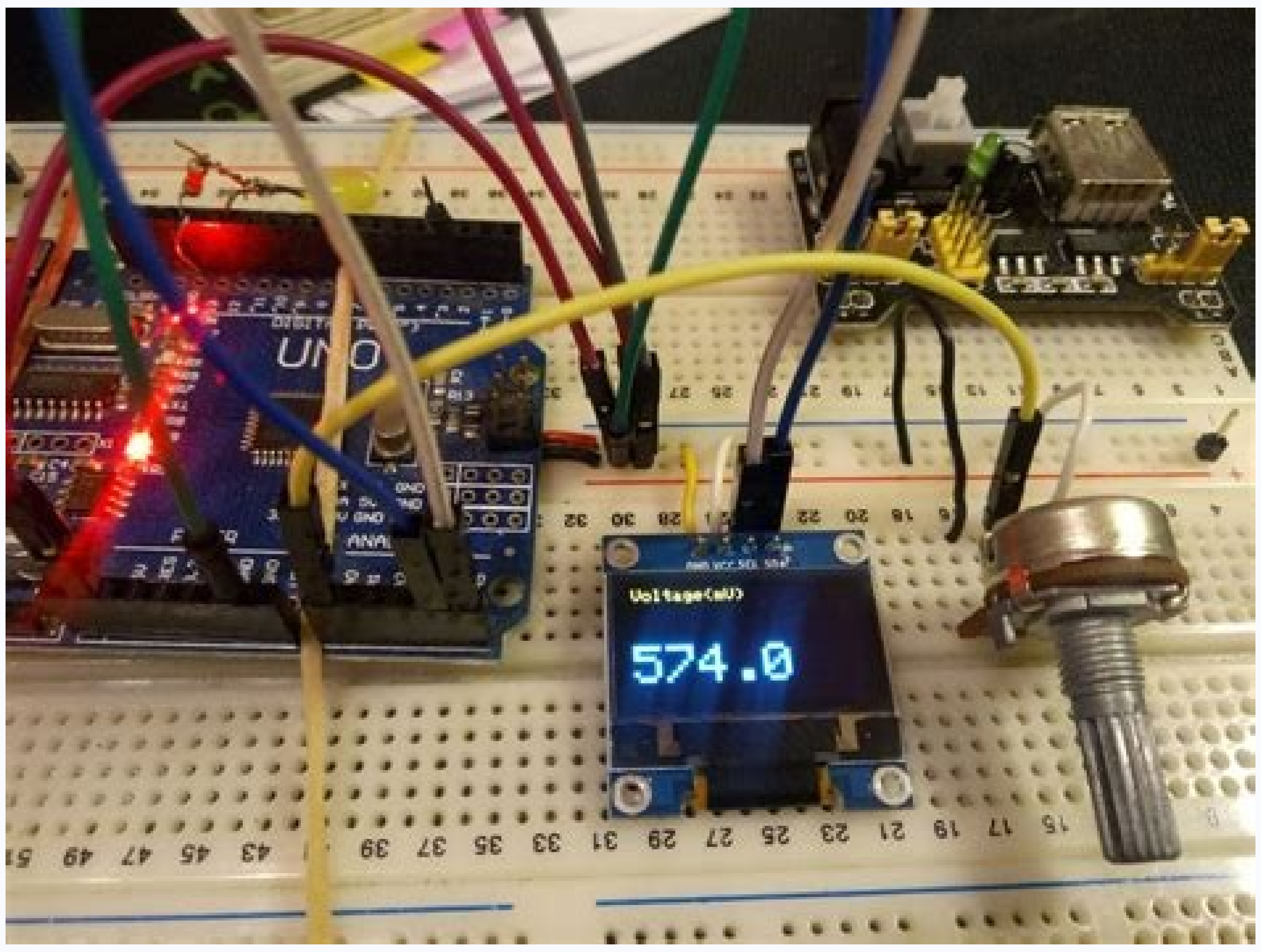
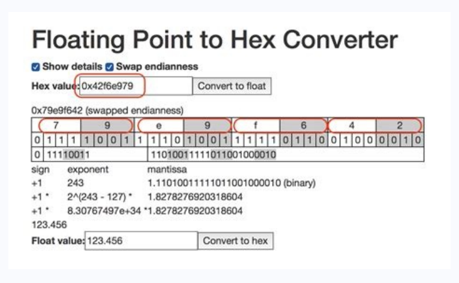




```
void setup()
{
  Serial.begin(115200);
}

void loop()
{
  float f = 123.12F;
  Serial.print("Original val
  Serial.println(f);

  char str[50];
  sprintf(str, "String valu
  Serial.println(str);

  Serial.println();
  delay(2000);
}
```

```
Original value: 123.12
String value: ?

Original value: 123.12
String value: ?

Original value: 123.12
String value: ?
```





Constructs an instance of the String class. There are multiple versions that construct Strings from different data types (i.e. format them as sequences of characters), including: a constant string of characters, in double quotes (i.e. a char array) a single constant character, in single quotes another instance of the String object a constant integer or long integer a constant integer or long integer, using a specified base an integer or long integer variable an integer or long integer variable, using a specified base a float or double, using a specified decimal places Constructing a String from a number results in a string that contains the ASCII representation of that number. The default is base ten, so String thisString = String(13); gives you the String "13". You can use other bases, however. For example, String thisString = String(13, HEX); gives you the String "d", which is the hexadecimal representation of the decimal value 13. Or if you prefer binary, String thisString = String(13, BIN); gives you the String "1101", which is the binary representation of 13. String(val) String(val, base) String(val, decimalPlaces) val: a variable to format as a String. Allowed data types: string, char, byte, int, long, unsigned int, unsigned long, float, double. base: (optional) the base in which to format an integral value. decimalPlaces: only if val is float or double. The desired decimal places. An instance of the String class. dtostrf() may be the function you need if you have a floating point value that you need to convert to a string. In this lesson you will learn exactly how to use dtostrf in your Arduino code. Do you need to convert a floating point value to a string? If that's the case, the dtostrf function may be the ticket you're looking for. In this lesson, you will learn exactly how to use the dtostrf function in your Arduino code to convert a floating point number to a string. (gentle music) Subscribe to our YouTube channel to get more videos like this. Are you learning Arduino programming? Check out our membership program to learn the software and hardware skills you'll need to build your own projects. You'll get an all access pass to our high quality video training that covers everything from the basics of programming like variables and control structures up to using interrupts, arrays and more. Follow the link in the description to sign up today. All right, let's just jump straight into this. Here is the dtostrf function and here are the parameters it expects. There's four different parameters. The first one is the floating point number that you wanna convert into a string. That's easy enough. So if you have a variable named value and it's like 1.6789, this is where you're gonna put that variable. The second value is the minimum field width, this is the minimum number of characters that will be in the output string. So if you set the minimum field width to six and you convert a floating point value that has greater than six digits, those extra digits will still display. And for counting purposes, the decimal point in the negative sign counted spaces, too. But if you set the minimum field width to six and you convert a floating point value that has less than six digits, then empty spaces will be added to the string before the number starts. What's kinda cool is the minimum field width can also be negative. If you pass a negative value, it will left justify the number within the field width and then it will insert the spaces after the number. The third argument passed to dtostrf is the precision. This is the number of digits that will be in the output array after the decimal point. So if you have a floating point value and it's got a bunch of digits after the decimal point but the precision number you pass is smaller, then dtostrf is gonna chop off all the rest of those values. And it is going to round that last value, so that it only shows the number specified by precision. Now, if you have a floating point value that doesn't have a bunch of digits after the decimal point, like 1.9 but the precision is a three then dtostrf will add trailing zeros after the value. The final argument pass to dtostrf is where you wanna store the output string. This is typically going to be a character array when you determining the size of this character buffer, make sure to consider what the biggest number might ever be. If you undersized this character array, dtostrf is still gonna stuff all those values in there and it can mess up the rest of your program. So make sure the size you a lot is big enough for the biggest number you could potentially pass. Keep in mind that the decimal point in the negative sign if the values negative need to be included in that count. And also you're gonna wanna add a one to the number for the null-terminating character that are found at the end of C strings. If you have no idea what that means, don't sweat it. Just make sure to add one to the size that you calculate. Well, Hey, I hope you found that helpful. As always, if you wanna get good at something. You got to practice it a little bit. So, go and write some code for dtostrf and play around with all these different parameters. All right. Hey, take it easy and I'll see you next time. dtostrf() syntax Let's jump straight into this. Here are the parameters that dtostrf() expects: dtostrf(float_value, min_width, num_digits_after_decimal, where_to_store_string) The first value is the floating point number that you want to convert into a string – that's easy enough. minimum field width The second value is the minimum field width. If you set the minimum field width to 6, and you convert a floating point value that has greater than 6 digits, those extra digits will still display. And for counting purposes, the "." decimal point and the "-" negative sign count as spaces too. If you set the minimum field width to 6, and you convert a floating point value that has less than 6 digits, then spaces will be added before the number starts. The minimum field width can also be negative. If you pass dtostrf() a negative value, it will left-justify the number within the field width. precision The 3rd argument passed to dtostrf() is the precision, which is the number of digits to show after the decimal point. If the floating point value you convert to a string has more digits after the decimal point than the number specified in the precision, then it will be cut off and rounded accordingly in the output string. If you pass a number with fewer digits after the decimal point, it will add trailing zeros to the number. dtostrf() char buffer sizing The final argument passed to dtostrf() is where you want to store the output string. This will typically be a character array, like buffer[7]. When determining the size of this buffer, make sure to consider: What the biggest number might ever be Size must include space for the "." and the possible "-" sign Add 1 for the null-terminating character "\0" Let Us know What are you using dtostrf() for? We'd love to know – tell us in the comments! Also, if you found this useful, you might also find our sprintf() lesson super handy as well. This tutorial will discuss two methods to convert a float into a string. One method is to use the String() function, and the other method is to use the concat() function.Convert Float to String Using the String() Function in ArduinoTo convert a float into a string using String(), you need two parameters to pass into this function. The first one is the value of the float you want to convert, and the second is the number of decimal places present in the float number.void loop{ String stringOne = String(5.698, 3);// using a float and the decimal places } In the above code, 5.698 is a float value and 3 is the number of decimal places. You can change these values according to the given float number. Check the link for more information.Convert Float to String Using the concat() Function in ArduinoTo convert a float into a string using concat() first, define an empty string and then pass the float number as a parameter in the concat() function. This method appends the parameter to the string.void loop(){ float parameter = 123.123; // floating number String myStringe = ""; // empty string myString.concat(parameter); } In the above code, a parameter is some number of type float, and myString is a variable of type String. The concat() function also returns a boolean, true if the operation is successful and false if unsuccessful. Check the link for more information.DelftStack articles are written by software geeks like you. If you also would like to contribute to DelftStack by writing paid articles, you can check the write for us page.Related Article - Arduino StringArduino strcmp FunctionArduino strcpy FunctionConcatenate Strings in Arduino Are you trying to figure out sprintf() with Arduino? Or maybe you want to display multiple variables on the serial monitor without having to use a bunch of separate Serial.print() statements. If so, you're in the right place. In this lesson you'll learn exactly how to use sprintf(). Are you trying to figure out S print F with Arduino or maybe you just want to display multiple variables on the serial monitor without having to use a bunch of separate serial print statements. If so, you are in the right place. In this lesson you'll learn exactly how to use S print F, stay tuned. Subscribe or YouTube channel to get more videos like this. Are you learning Arduino programming? Check out our membership program to learn the software and hardware skills, you'll need to build your own projects. You will get an all access pass to our high quality video training that covers everything from the basics of programming, like variables and control structures up to using interrupts, arrays and more. Follow the link in the description to sign up today. All right, well, let's say you want to print this line of text to the serial monitor, where the number of burritos and the temperature value are both variables. Using the serial print function, would take like five lines of code just to print out this single line of text. In fact, for every variable we add to the output string, we have to add two more serial prints in the code. So, if we wanted to print something with four variables inserted into our string, it'd take like nine lines of code. This is where S print F comes in-handy. We can print out as many variables into our string as we want. In the amount of code required stays right at about three lines. Here are the three lines of code you'll need. First, you need a character array to save the output string into. Then you need the S print F function, which is gonna take some texts and variables and combine it into a single stream. Finally, we'll use the serial print function to display the formatted string. So, let's take a closer look at each of these lines of code. So, the first thing is a character, buffer character array. The character rate needs to be large or larger than the final outfit string. So, you need to count the characters you plan to store in that string and make sure that the buffer is at least that large. The next line of code is the actual S print F function. S print F stands for String Print Formatted. The function takes a minimum of two arguments. The first argument is where you plan to store the string that S print F will be making for you. This is where we use that character buffer that we just created on the previous line. So, the string that S print F formats is going to be stored in this character buffer. The next argument is the string that you want to create. It's gonna be filled in with format specifiers where you want to insert your variables. The format specifier starts with the percent sign and the letter following the percent sign is called the format character. And it tells, S print F what data type is gonna be used for that variable. So, in this example, we have two format specifiers. This means that we want two variables inserted into the output string. Now, these character specifiers are a little weird at first. They're just these letters that stand for the kind of data type that's gonna be inserted. And once you learn what each letter means it starts to make a little more sense. But until you figure that out it's kind of like, what does this mean? So, here are some of the common character specifiers, a D or an I is a signed decimal integer. A U is an unsigned decimal integer and an S is a string of characters. So here, when we see this percent sign D, we are telling S print F to format the inserted variable as assigned decimal integer. Now, if you're wondering like, what the heck is assigned decimal integer? Well, here's a scoop, signed means that it can be positive or negative, decimal means that we want it to show up in decimal form, instead of like formatted as an octal or a hexadecimal or something like that. Integer means that it's just a whole number that is there aren't any decimal points in it. In this example, we're also using the S character specifier. This specifies a string of characters. So, where does S print F actually find the variables to insert? Well, we actually don't have to look too far, because those are the arguments added right after the string. For every format specifier, you must pass a matching value. These values are added as additional arguments to S print F, each one separated by a comma. In this example, we have two format specifiers. Therefore, we have two arguments at the end. The first one, numBurritos will get inserted at that first format specifier. The second one, tempStr will get inserted at the second format specifier. If we add more format specifiers in our string, we'd need to add more arguments to the end of S print F, hopefully this whole S print F thing is kind of making sense so far. But maybe you've got this little nagging question right now, you're like, "Hey, wait a second, I thought you said that the S character formator was for a string of characters, but the temperature in Fahrenheit is a floating point value, what gives? Well, here's the deal, S print F with Arduino cannot handle floating point values. So, if you have to print something that has a decimal point, like 3.14 or 156.7, then you need to convert that float value to a character string first, and then you can print the string. A handy way to do that is with D to string F, which converts a floating point value to string. We won't get into that now, but be sure to check out our other video on using D to string F with Arduino. Okay, the final line of code in our trifecta here, is the good old serial print. And what we pass as an argument is the character buffer where S print F stored are formatted string. You'll notice that S print F isn't returning the string itself, it saves that string into the character buffer we had specified, which is why all we have to do is print the buffers content to display the string. Now it's worth noting that S print F does return a value, if you choose to use it. Which is the total number of characters that have been stored into the buffer. This return value excludes the null terminating character, that's also added by S print F. So, now with these three lines of code, we can open up the serial monitor and see that the string has been inserted with the variables showing up pretty nicely. So, using just these three lines of code, we can insert a bunch of variables into a single string and print it out to the serial monitor. And it comes up nicely formatted. If we ever want to go back and add more variables to the string, all we have to do is add the appropriate format specifiers and then the corresponding values to the S print F function. And hey, we're good to go. Okay, let's do a quick review of what we've learned about S print F. The first value that the S print F function expects is a character buffer. This is where the formatted string will be stored. The second value in S print F is the string you want to format with any format specifiers. The final arguments are the values you want to replace the format specifiers with. Now, believe it or not there's actually a ton more stuff that you can do with S print F, in fact between the percent sign in the character specifier, you can insert what are called sub specifiers. In these things we'll do everything from left justify the inserted values to add leading zeros and more. It's actually pretty cool. Let us know in the comments, if you're interested in a following lesson, using more of these optional S print F sub specifiers and we'll see what we can do. Thanks a lot and I hope you have a great day. Bye. Just using Serial.print() Let's say you want to print this line of text to the serial monitor: "The 3 burritos are 147.7 degrees F" Where the number of burritos and the temperature value are both variables. Using Serial.print() would take 5 lines of code to print out just this single line of text. Serial.print("The "); Serial.print(numBurritos); Serial.print(" burritos are "); Serial.print(tempStr); Serial.println(" degrees F"); In fact, for every variable you add to the output, you add two more serial prints in the code. What if you wanted to print a line with 4 variables inserted into a string like this: "The 3 burritos are 147.7 degrees F, weigh 14oz, and were finished 3 minutes ago." It would take 9 lines of code! sprintf() to the rescue This is where sprintf() comes in handy. We can print out as many variables into our string as we want, and the amount of code required stays at 3 lines. Here the three lines of code you'll need: char buffer[40]; sprintf(buffer, "The %d burritos are %s degrees F", numBurritos, tempStr); Serial.println(buffer); First you need a character array to save the output string into. Then you need the sprintf() function, which will combine our text and variables into a string. Finally, you use Serial.print() to display the formatted string. Let's take a closer look at each line of code. char buffer[40]; The character array needs to be as large, or larger than the final output string. So count the characters you plan to store in that string, and make sure the buffer is at least that large. The next line of code is the actual sprintf() function. sprintf() stands for "string print format(ted)". sprintf(buffer, "The %d burritos are %s degrees F", numBurritos, tempStr); sprintf() takes a minimum of 2 arguments. The first argument is where you plan to store the string that sprintf() will be making for you. This is where you use the character buffer that you created on the previous line. The next argument is the string you want to create, filled in with format specifiers where you want to insert your variables. The format specifier is the % sign. The letter following the format specifier is called the format character, and it tells sprintf() what datatype will be used for that variable. "The 3 burritos are 147.7 degrees F" In this example we have 2 format specifiers (%) – this means we want 2 variables inserted into the output string. The character specifiers are a little weird at first. They are simply letters that stand for the kind of data type that will be inserted – once you learn what each letter means it starts to make more sense. Character specifiers Here are some of the common character specifiers: d or i – signed decimal integer u – unsigned decimal integer s – string of characters When we use the %d, we are telling sprintf() to format the inserted variable as a signed decimal integer. If you are wondering what a signed decimal integer is here is the scoop: Signed means it can be positive or negative. Decimal means we want it to show up in decimal form, instead of formatted into octal or hexadecimal Integer means it is a whole number, that is, there aren't any decimal points. The other character specifier used is %s – this specifies a string of characters. Now where does sprintf() actually find the variables to insert? Well, we don't have to look too far, because those are the arguments added right after the string. sprintf(buffer, "The %d burritos are %s degrees F", numBurritos, tempStr); For every format specifier, you must pass a matching value. These values are added as additional arguments to sprintf(), each one separated by a comma. In this example, we have two format specifiers, and therefore we have 2 arguments at the end. The first one, numBurritos will get inserted at the first format specifier. The second one, tempStr, will get inserted at the second format specifier. If we had more format specifiers in our string, we'd need to add more arguments to sprintf(). What about floating point numbers? Now you might be like.... "Wait a second now – I thought you said the "s" character formatter was for a string of characters, but the temperature in Fahrenheit is a floating point value – what gives?!" Well, here's the deal, sprintf() with Arduino cannot handle floating point values. So if you have to print something that has a decimal point, like 3.14 or 156.7, then you need to convert that float value to a character string first, and then print the string. A handy way to do that is with dtostrf(), which converts a floating point value to a string. We won't get into that now, but be sure to check out our other video on using dtostrf() with Arduino. OK, the final line of code in our trifecta is the good 'ol Serial.print(), and what we pass as an argument is the character buffer where sprintf() stored our formatted string. You'll notice that sprintf() isn't returning the string itself – it saves that string into the character buffer we specified – which is why all we have to do is print the buffers contents to display our string. It is worth noting that sprintf does return a value, if you choose to use it, which is the total number of characters that have been stored into the buffer. This return value excludes the null terminating character that is also added by sprintf(). Now, when we open up the Serial Monitor, we can see our string with the inserted variables showing up nicely. If we want to insert more variables into a string, all we have to do is add the appropriate format specifiers, and the corresponding variables to the sprintf() function and we're good to go! sprintf() review OK, let's do a quick review of sprintf() The first value sprintf() expects is a character buffer – this is where the formatted string will be stored! The second value in sprintf() is the string you want to format, with any format specifiers. The final arguments are the values you want to replace the format specifiers with. Now, believe it or not, there is a ton more stuff you can do with sprintf()! In fact, between the % sign and the character specifier you can insert sub-specifiers that do everything from left justify the inserted values, to adding leading zeros and more. Let us know in the comments if you're interested in a follow-on lesson about using the optional sprintf() sub-specifiers. Have a great one!

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