

Capacitive touch example (from [Sew Electric](http://www.505access.com/capacitive_touch-example-from-sew-electric/) by Leah Buechley and Kanjun Qiu):

- 1) Copy sketch ([http://www.505access.com/capacitive\\_touch-example-from-sew-electric/](http://www.505access.com/capacitive_touch-example-from-sew-electric/)) into the Arduino IDE and name it **capacitive\_touch** (a directory with this name is created automatically with the file **capacitive\_touch.ino** inside):

```
// The following is an example from the book _Sew Electric_
//   by Leah Buechley & Kanjun Qiu,
// project: Fabric Piano, pp106 - 122.
// supplementary webpage:
//   http://sewelectric.org/misc/capacitivesensingcode/
//
// This code consists of a procedure called readCapacitivePin
// The procedure takes one input: an Arduino pin number
// The procedure outputs: a number, from 0 to 17, which
// indicates how much capacitance is on the pin.
// When you touch the pin, or anything attached
// to the pin, the number will get higher

int key1 = 6;
int touchValue;

void setup() {
  pinMode(key1, INPUT);
  Serial.begin(9600);
}

void loop() {
  touchValue = readCapacitivePin(key1);
  Serial.println(touchValue);
  delay(100); // key1 is sampled every 100 miliseconds
}

uint8_t readCapacitivePin (int pinToMeasure) {
  // Variables used to translate from Arduino to AVR pin naming
  volatile uint8_t* port;
  volatile uint8_t* ddr;
  volatile uint8_t* pin;
  // Here we translate the input pin number from
  // Arduino pin number to the AVR PORT, PIN, DDR,
  // and which bit of those registers we care about.
  byte bitmask;
  port = portOutputRegister(digitalPinToPort(pinToMeasure));
  ddr = portModeRegister(digitalPinToPort(pinToMeasure));
  bitmask = digitalPinToBitMask(pinToMeasure);
  pin = portInputRegister(digitalPinToPort(pinToMeasure));
  // Discharge the pin first by setting it low and output
  *port &= ~(bitmask);
  *ddr |= bitmask;
  delay(1);
}
```

```

// Make the pin an input with the internal pull-up on
*ddr &= ~(bitmask);
*port |= bitmask;

// Now see how long it takes for the pin to get pulled up.
// This manual unrolling of the loop
// decreases the number of hardware cycles between each read of the pin,
// thus increasing sensitivity.
uint8_t cycles = 17;
if (*pin & bitmask) { cycles = 0;}
else if (*pin & bitmask) { cycles = 1;}
else if (*pin & bitmask) { cycles = 2;}
else if (*pin & bitmask) { cycles = 3;}
else if (*pin & bitmask) { cycles = 4;}
else if (*pin & bitmask) { cycles = 5;}
else if (*pin & bitmask) { cycles = 6;}
else if (*pin & bitmask) { cycles = 7;}
else if (*pin & bitmask) { cycles = 8;}
else if (*pin & bitmask) { cycles = 9;}
else if (*pin & bitmask) { cycles = 10;}
else if (*pin & bitmask) { cycles = 11;}
else if (*pin & bitmask) { cycles = 12;}
else if (*pin & bitmask) { cycles = 13;}
else if (*pin & bitmask) { cycles = 14;}
else if (*pin & bitmask) { cycles = 15;}
else if (*pin & bitmask) { cycles = 16;}

// Discharge the pin again by setting it low and setting
// it to be an output.
// It's important to leave the pins low if you want to
// be able to touch more than 1 sensor at a time - if
// the sensor is left pulled high, when you touch
// two sensors, your body will transfer the charge between
// sensors.
*port &= ~(bitmask);
*ddr |= bitmask;

return cycles;
}

```

- 2) Connect wire and/or other conductive materials to pin numbered 6 on the Arduino Leonardo board.
- 3) Upload sketch **capacitive\_touch** to board.
- 4) Click on Serial Monitor (upper right corner of Arduino IDE window).
- 5) Touching the conductive materials in 2) will result in changes in output printed to the Serial Monitor window.