void setup() {

// put your setup code here, to run once:

Serial.begin(9600);

randomSeed(analogRead(0));

}

void loop() {

Serial.println("Compare the given results with what calculated by Arduino.");

Serial.println();

float x=12.34;

float y=5.678;

float z=x/y;

int t=x/y;

Serial.println();

Serial.println((String) "Note that 12.34/5.678=2.17330");

Serial.println((String) "float z=12.34/5.678= "+z);

Serial.println((String) "int t=12.34/5.678= "+t);

Serial.println();

Serial.println((String) "Reminder of 5/2 is:"+5%2);

Serial.println((String) "Reminder of 7/4 is:"+7%4);

Serial.println();

Serial.println("sin, cos and tan takes the angle in RADYANS.");

Serial.println((String)"Note that sin(pi/6)=0.5");

Serial.println((String) "sin(pi/6)= "+sin(PI/6));

Serial.println();

Serial.println((String)"Note that cos(pi/6)=0.866");

Serial.println((String) "cos(pi/6)= "+cos(PI/6));

Serial.println();

Serial.println((String)"Note that tan(pi/6)=0.5774");

Serial.println((String) "tan(pi/6)= "+tan(PI/6));

Serial.println();

Serial.println((String)"Note that cot(pi/6)=1.7319");

Serial.println((String) "cot(pi/6)= "+1/tan(PI/6));

Serial.println();

Serial.println((String)"Note that atan(1.5)=0.98279 Rad");

Serial.println((String) "atan(1.5)= "+atan(1.5));

Serial.println((String) "atan2(1.5,1)= "+atan2(1.5,1));

Serial.println((String) "atan2(-1.5,-1)= "+atan2(-1.5,-1));

Serial.println();

Serial.println((String)"Note that exp(2.6)=13.4637");

Serial.println((String) "exp(2.6)= "+exp(2.6));

Serial.println();

Serial.println((String)"Note that ln(2)=0.6931 and log10(2)=0.3010");

Serial.println((String) "log(2)= "+log(2));

Serial.println((String) "log10(2)= "+log10(2));

Serial.println();

Serial.println((String) "floor(1.2)= "+floor(1.2));

Serial.println((String) "floor(-1.2)= "+floor(-1.2));

Serial.println((String) "ceil(1.2)= "+ceil(1.2));

Serial.println((String) "ceil(-1.2)= "+ceil(-1.2));

Serial.println((String) "abs(-123)= "+abs(-123));

Serial.println((String) "abs(-123.456)= "+abs(-123.456));

Serial.println();

Serial.println((String)"Note that 5.2^3.4=271.901");

Serial.println((String) "5.2^3.4= "+pow(5.2,3.4));

Serial.println();

Serial.println((String)"Note that 7.3^0.5=2.7019");

Serial.println((String) "sqrt(7.3)= "+sqrt(7.3));

Serial.println();

Serial.println((String) "square of 1.23, i.e. 1.23^2= "+ sq(1.23));

Serial.println((String) "square root of 1.23, i.e. 1.23^0.5= "+ sqrt(1.23));

Serial.println();

Serial.println((String) "Random number between 10 and 20: "+random(10,20+1));

Serial.println((String) "Random number between 0 and 20: "+random(20+1));

Serial.println();

Serial.println((String) "Max(1.23,4.56)= "+ max(1.23,4.56));

Serial.println((String) "Min(1.23,4.56)= "+ min(1.23,4.56));

Serial.println(); //https://www.arduino.cc/reference/en/language/functions/math/constrain/

Serial.println((String) "constrain(0,1,10)= "+constrain(0,1,10));

Serial.println((String) "constrain(5,1,10)= "+constrain(5,1,10));

Serial.println((String) "constrain(15,1,10)= "+constrain(15,1,10));

delay(60000);

}

//int take values from -32768 to 32767

//unsigned int take values from 0 to 65535

//short take values from -32768 to 32767

//long take values from -2147483648 to 2147483647

//unsigned long take values from 0 to 4294967295

//byte take values from 0 to 255

//word take values from 0 65535

//float take values from -3.4028235E38 to +3.4028235E38

int i=33000;

void setup() {

// put your setup code here, to run once:

Serial.begin(9600);

}

void loop() {

// put your main code here, to run repeatedly:

Serial.println("Value of 33000 is assigned to int variable i.");

Serial.println((String)"Value of i is: "+i);

delay(10000);

}

double a=1E3;

double b=5.3E-2;

double c=1.23e-4;

void setup() {

// put your setup code here, to run once:

Serial.begin(9600);

}

void loop() {

// put your main code here, to run repeatedly:

Serial.println("1000\*0.053=53");

Serial.println((String)"a\*b= "+a\*b);

Serial.println();

Serial.println("1000\*0.000123=0.123");

Serial.println((String)"a\*c= "+a\*c);

Serial.println();

Serial.println("0.053\*0.000123=0.0000065190");

Serial.println((String)"b\*c= "+b\*c);

Serial.println();

delay(15000);

}

int dutyCycle=0;

void setup() {

pinMode(9,OUTPUT);

}

void loop() {

dutyCycle = analogRead(A0);

dutyCycle = map(dutyCycle, 0, 1023, 0, 255);

analogWrite(9, dutyCycle);

}

int a=1; //a take values from -32768 to 32767

unsigned int b=1; //b take values from 0 to 65535

short c=1; //c take values from -32768 to 32767

long d=1; //d take values from -2147483648 to 2147483647

unsigned long e=1; //e take values from 0 to 4294967295

byte f=1; //f take values from 0 to 255

word g=1; //g take values from 0 65535

float h=1.0; //h take values from -3.4028235E38 to +3.4028235E38

double i=1.0;

char j='a';

bool k=false;

char ch[]={'A','r','d','u','i','n','o'};

void setup() {

// put your setup code here, to run once:

Serial.begin(9600);

}

void loop() {

// put your main code here, to run repeatedly:

Serial.println((String)"int takes "+sizeof(a)+" Bytes.");

Serial.println((String)"unsigned int takes "+sizeof(b)+" Bytes.");

Serial.println((String)"short takes "+sizeof(c)+" Bytes.");

Serial.println((String)"long takes "+sizeof(d)+" Bytes.");

Serial.println((String)"unsigned long takes "+sizeof(e)+" Bytes.");

Serial.println((String)"byte takes "+sizeof(f)+" Bytes.");

Serial.println((String)"word takes "+sizeof(g)+" Bytes.");

Serial.println((String)"float takes "+sizeof(h)+" Bytes.");

Serial.println((String)"double takes "+sizeof(i)+" Bytes.");

Serial.println((String)"char takes "+sizeof(j)+" Bytes.");

Serial.println((String)"bool takes "+sizeof(k)+" Bytes.");

Serial.println((String)"char array {'A','r','d','u','i','n','o'} takes "+sizeof(ch)+" Bytes.");

Serial.println("--------------------------------");

delay(60000);

}

int a=0b10110010; // You can use int a=0B10110010;

int b=0xC1F; // You can use int b=0XC1F;

void setup() {

// put your setup code here, to run once:

Serial.begin(9600);

}

void loop() {

// put your main code here, to run repeatedly:

Serial.println((String)"Value of a in decimal is: "+a);

Serial.print("Value of a in binary ");

Serial.println(a,BIN);

Serial.print("Value of a in Hexadecimal ");

Serial.println(a,HEX);

Serial.println();

Serial.println((String)"Value of b in decimal is: "+b);

Serial.print("Value of b in binary ");

Serial.println(b,BIN);

Serial.print("Value of b in Hexadecimal ");

Serial.println(b,HEX);

Serial.println("------------------------------");

delay(60000);

}