Robotics & Automation

DIGITAL DICE KIT

USER MANUAL

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Introduction:

In Education Module, SVR InfoTech offers electronically Digital dice. The digital dice uses a function called random number generator available in most of the programming languages. When we are programming for digital dice, we use this function to generate any number from 1 to 6. We use an Arduino Uno microcontroller for the process and a seven-segment display to display the number. Mathematical concept of probability is used in Digital Dice Kit. Water and Dust proof IP65 rated box.

General Precautions:

Caution: To avoid injury, damage to the robot or equipment, please follow the provided guidelines.

1. Keep away from pets and animals of any kind, animals may behave erratically in the presence of the robot.
2. If the robot is operating abnormally, there is an unusual sound, smell or smoke is detected:
    a. Turn off the robot immediately
3. Always follow the installation and service instructions closely. Keep manuals for future reference.
4. This guide does not cover all possible safety issues or conditions. Always use common sense and good judgment.
5. Please take care of this unit and its accessories, keep them clean. Please do not let this unit or accessories exposed to fire/burning cigarettes, etc... Try to keep the robot and its accessories dry; please do not let this unit exposed to water or moisture.
6. Please do not break, throw or trample the robot.
7. Avoid installation in extremely hot, rainy or water splashing, or being placed in high temperature or moist environment.
8. Please use the accessories provided with this robot.

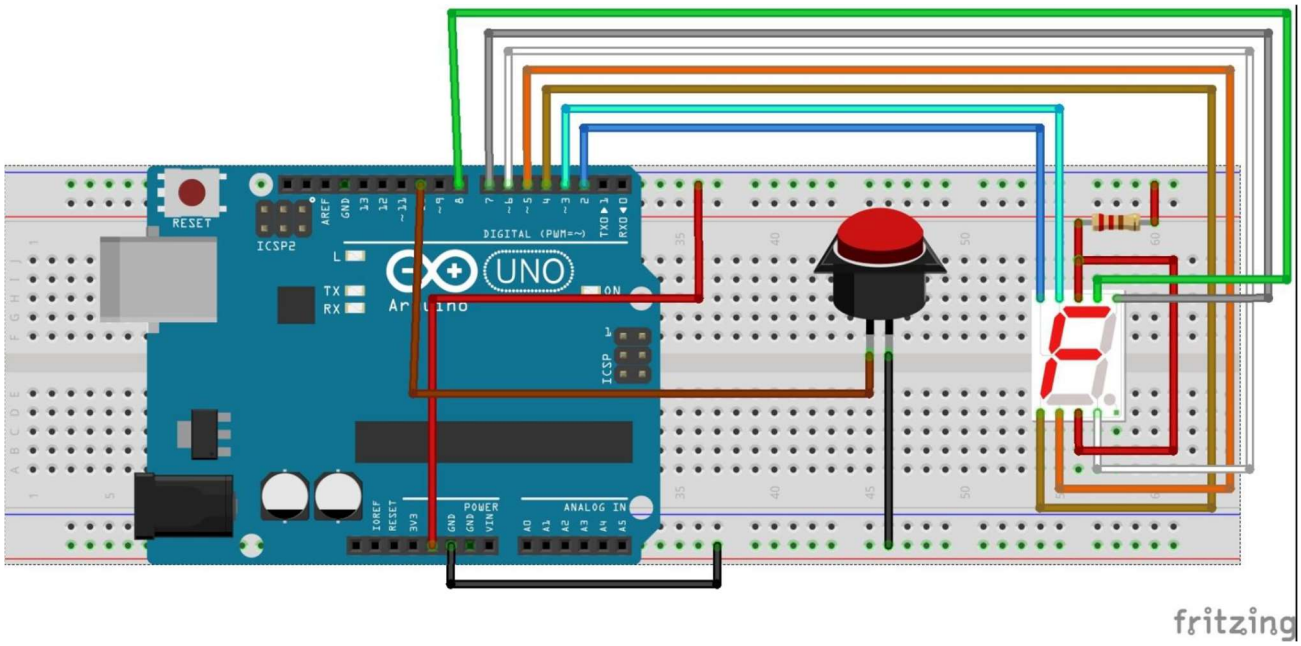
Components:

MECHANICAL COMPONENTS		
SR. NO.	PART NAME	QUANTITY
1	Plastic Enclosure box (IP65)	1
2	Upper Acrylic Plate	1
3	Bottom Acrylic Plate	1
4	M3*45 (Spacers)	4
5	M3*6 (Nut)	8

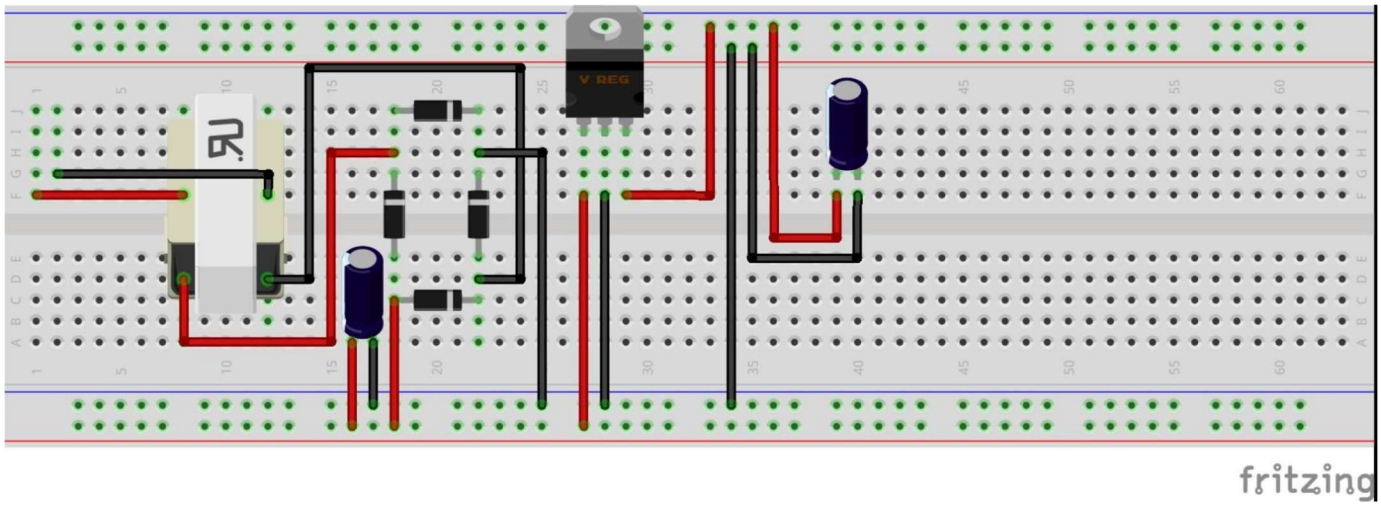
ELECTRICAL COMPONENTS		
SR. NO.	PART NAME	QUANTITY
1	Arduino Uno	1
2	Seven Segment Display Common Anode	1
3	Breadboard	1
4	5V Power Supply	1
5	1 K ohm's resistor	1
6	Push Button	1

PREREQUISITES		
SR. NO.	PART NAME	QUANTITY
1	Personal Computer with Arduino IDE	1
2	USB B to USB A cable	1

Circuit Diagram:



Circuit Diagram



Power Supply

Connections:

Arduino and Seven Segment Display		
SR. NO.	Seven Segment Display pins	Arduino Pins
1	A	D8
2	B	D7
3	C	D6
4	D	D5
5	E	D4
6	F	D3
7	G	D2

For Reset Button		
SR. NO.	IR Sensor Pins	Arduino Pins
1	Count	D10

Code Explanation:

Programming part of this project plays a very important role to display random digital dice number on seven segment display. Arduino does not contain any library for seven segment display. so we created whole code without using any library.

First, we define digital pin for seven segment display.

```
int pin[7]={6,5,4,3,2,1,0};
```

After it we create an array of 6 digits of dice namely 1, 2, 3, 4, 5 and 6.

```
char digit[6]={0x02, 0x79, 0x24, 0x30, 0x19, 0x12};
```

Now we give direction to use Arduino pin as output.

```
void setup()
{
for(int i=0;i<7;i++)
pinMode(pin[i], OUTPUT);
pinMode(dice, INPUT);
pinMode(resett, INPUT);
digitalWrite(dice, HIGH);
digitalWrite(resett, HIGH);
```

We send a code for displaying zero on seven segment display by default.

```
int temp=0x40;
for(int i=0;i<7;i++)
{
int temp1=temp&0x01;
digitalWrite(pin[i], temp1);
```

```
temp=temp>>1;
}
```

Now we run rand() function to get a random number.

```
int temp=rand();
```

And when we press the dice button program first map this random number and then send number to seven segment display by using bit wise operator.
We send a code for displaying zero on seven segment display by default.

```
if(digitalRead(dice)==0)
{
int k=temp%6;
temp=digit[k];
wait();
for(int i=0;i<7;i++)
{
int temp1=temp&0x01;
digitalWrite(pin[i], temp1);
temp=temp>>1;
}
delay(200);
}
```

Code:

```
#define dice 10
char digit[6]={0x02, 0x79, 0x24, 0x30, 0x19, 0x12};
int pin[7]={8,7,6,5,4,3,2};
void setup()
{
for(int i=0;i<7;i++)
pinMode(pin[i], OUTPUT);
pinMode(dice, INPUT);
digitalWrite(dice, LOW);
int temp=0x40;
```

```
for(int i=0;i<7;i++)
{
int temp1=temp&0x01;
digitalWrite(pin[i], temp1);
temp=temp>>1;
}
delay(1000);
}
void loop()
{
int temp=rand();
if(digitalRead(dice)==1)
{
int k=temp%6;
temp=digit[k];
wait();
for(int i=0;i<7;i++)
{
int temp1=temp&0x01;
digitalWrite(pin[i], temp1);
temp=temp>>1;
}
delay(2000);
}
else {
temp=0x40;
for(int i=0;i<7;i++)
{
int temp1=temp&0x01;
digitalWrite(pin[i], temp1);
temp=temp>>1;
}
}
}
void wait()
{
for(int m=0;m<10;m++)
{
for(int k=0;k<6;k++)
{
int ch=digit[k];
for(int l=0;l<7;l++)
{
char tem2=ch&0x01;
digitalWrite(pin[l], tem2);
ch=ch>>1;
}
delay(50);
}
}
}
```

Warranty Terms and Conditions:

Warranty Period: - 1year for mechanical components & 90 Days for electronic components from the date of delivery.

What is covered: - Any Technical defect, malfunctioning.

What is not covered: - Physical Damage, Water Damage, Wear & Tear.

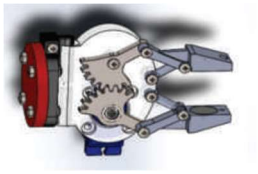
What will we do: - Repair or Replacement whichever will be applicable.

Other terms and conditions: -

- Warranty will be void if warranty seals are broken.
- The warranty will be void if the product is mishandled.
- Warranty will be void on installation to wrong voltage, overload, and wrong application.
- Use other than in accordance with handling instructions.
- The warranty will not extend after replacement.

OUR OTHER PRODUCTS

Hast Articulated Robot



Miniature Geared Gripper

Miniature Cam Guided Gripper

Miniature Curvilinear Gripper

Tele ECG

SCARA Robot

Flexible Robotic System

Robotic leech

Self-Balancing Robot

Ultrasonic Scanner

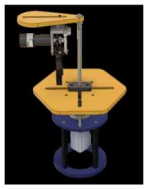
Maze Robot

Temperature Controlled Fan Kit

Multi Gripper Robot

Conveyor Belt object counter

Line Follower Robot System



Parallel Manipulator Gripper stem

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