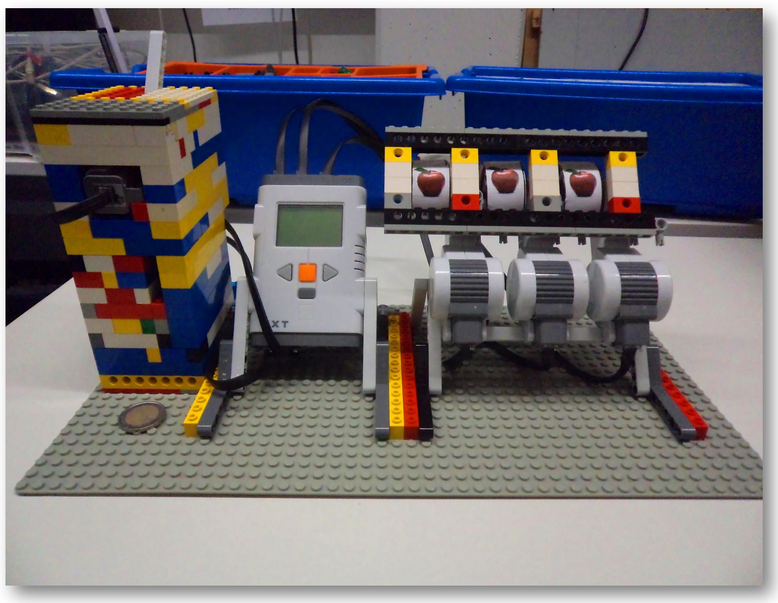
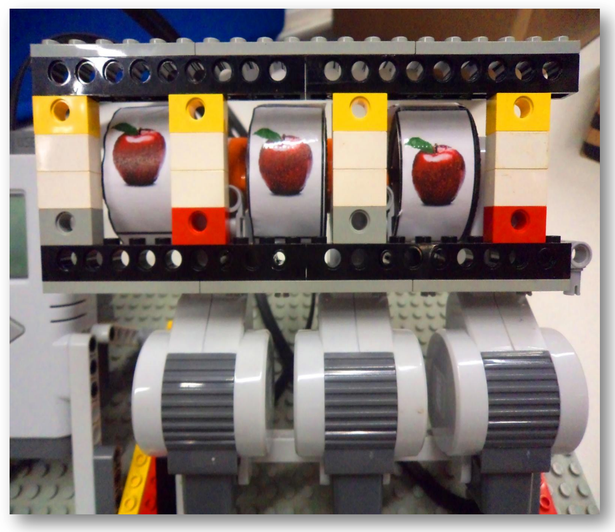
NXT Slot Machine B



Basic Information

The project is slot machine construction using **Lego Mindstorms NXT**. The goals are to construct a physical slot machine and to program it using **NXC (Not eXactly C)**. Construction part one is reels designing. Construction part two is coin slot and lever designing. **Randomness** is the most important algorithm in the programming part. Player will put the coin in the slot. Then they will be able to push the lever to make three reels start rotating in different random speed and angle.

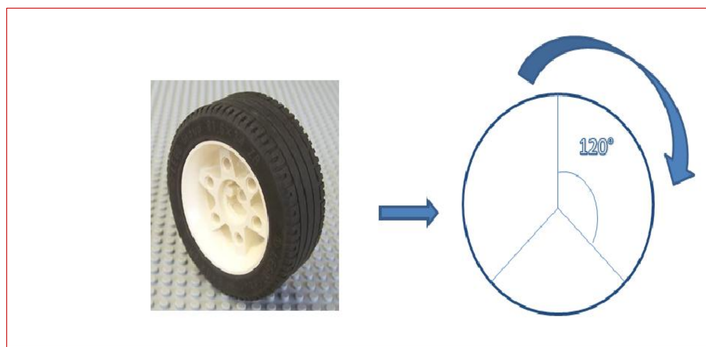


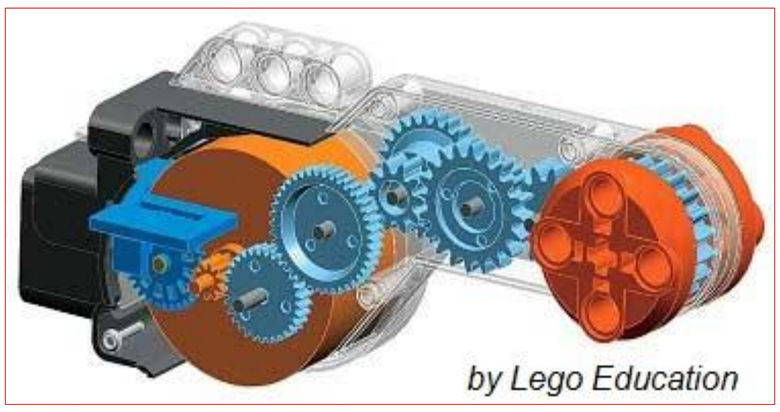
Reels Design

There are three pictures on reels: Apple, Banana, Mango. The reels are constructed with three motors. NXT motors have class for accessing NXT motor ports. Three Reels: each reel is divided in three equal angles (120 of 360 degree). Three picture planes: Apple, Banana, Mango are cut and designed to be parallel with size and angles of the reels.

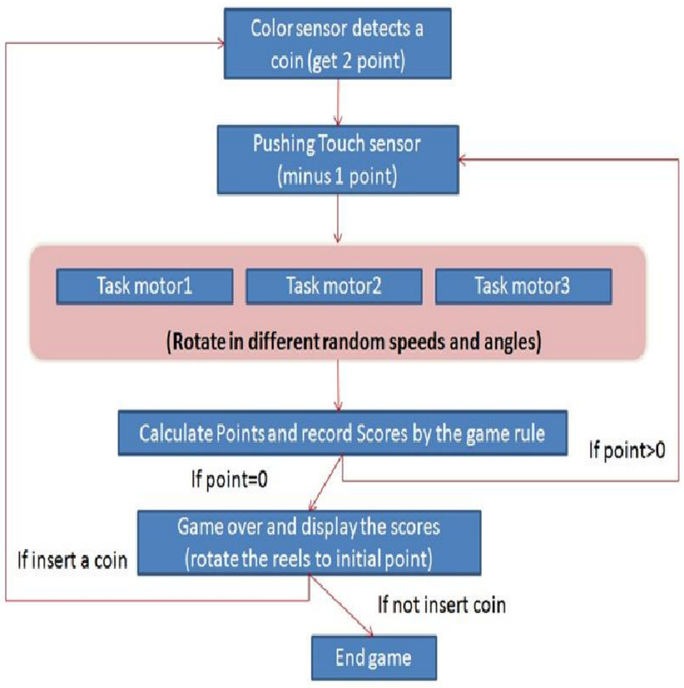
Programming

The program of the project uses NXC (Not eXactly C) as a programming language similar to C language, invented by John Hansen, which was especially designed for the Lego robots. The integrated development environment (IDE) is theBricx Command Center (BricxCC). Random function ***int Random (unsigned int n)*** is the most important part of the program for generating random speed and angles. Return a signed or unsigned 16-bit random number. If the optional argument n is not provided the function will return a signed value. Otherwise the returned value will range between ***0*** and ***n.***

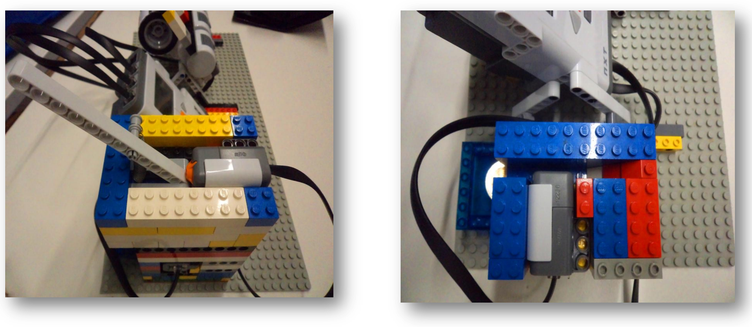





```
// rotate motor1
task motor1()
{
  da=D; // rotate in a random angles
  d1=(da+120+d1)%360; //find the position of the angle
  RotateMotor(OUT_A, A,-da);
  RotateMotor(OUT_A,15,-120);
  Off(OUT_A);

  //Display the result on the screen:

  if(d1==0){TextOut(30,LCD_LINE1,"Apple");s1=360;}
  if(d1==120){TextOut(30,LCD_LINE1,"Banana");s1=120;}
  if(d1==240){TextOut(30,LCD_LINE1,"Mango");s1=240;}
  NumOut(0,LCD_LINE1,s1);

  Release(moveMutex1);
  //execute other tasks after finishing rotating the motor
}
```




```
 //The random speed of motor A: 25,30,50,...,75
#define A 50/Random(5)+25
#define B 50/Random(5)+25
#define C 50/Random(5)+25

//The random angle: 120,240,360,480,...,2400,2520,2640
#define D 120*(Random(10)+12)
```



Coin Slot and Lever Design

Coin slot is designed with color sensor which distinguishes the color between coin and the wall of coin slot when the coin runs across the sensor. Lever is designed with touch sensor. The Touch Sensor gives robot a sense of touch. The Touch Sensor detects when it is being pressed by something and when it is released again. After putting coin, players can push the lever to make the reels rotating.

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