Basics for Project Zero (Quick Reference)

Basic Functions

1. To move forward : MotorsForward(MOTOR\_ports of wheels, power, turn ratio);
   * Ex: MotorsForward(MOTOR\_AC, 45, 0 );
2. To move Backwards : *MotorsReverse(MOTOR\_ports of wheels, power, turn ratio);*
   * Ex: MotorsReverse(MOTOR\_AC, 45, 0);
3. To Determine for how long the function should work: *Wait(time);*
   * Ex: Wait(1000);
4. To Turn: Move forwards or Backward with just *one wheel*
   * To turn when moving backwards
     1. Ex:

MotorsReverse(MOTOR\_C, 75, 0);

Wait(360);

* + To turn when moving forwards

Ex:

MotorsForward(MOTOR\_A, 75, 0);

Wait(360);

1. To power off wheels: *Off(OUT\_Ports of wheels);*
   * Ex: Off(MOTOR\_AC);
2. To just power off the wheels (not braking):  Coast(MOTOR\_ports of wheels)
   * Ex: Coast(MOTOR\_AC);

To Use Sensors

1. To use the light sensor:
   1. You need to add the following line at the very top of your program:

**#include** "SensorUtilities.nxc"

* 1. You need to add a THRESHOLD value to test the light sensor against. Add this after any include statements that you have, for example

**#define** THRESHOLD1 30

* 1. You need to declare a variable to store the sensor value when it is scanning.

**int** sensorValue = **CheckSensor**(S1);

* 1. You need to configure the sensor in your program (for example in task main)

**ConfigSensor**(S1, SENSOR\_TYPE\_LIGHT\_INACTIVE,

SENSOR\_MODE\_PERCENT, **false**);

* 1. Then you use the value of sensorValue (or whatever you called your variable) in your code for comparisons or statements such as:

**If**(sensorValue > THRESHOLD1)

{

MotorsReverse(MOTOR\_C, 75, 0);

}

1. To use the sound sensor:
   1. You need to add the following line at the very top of your program

**#include** "SensorUtilities.nxc"

* 1. You need to add a THRESHOLD value to test the light sensor against. Add this after any include statements that you have, for example

**#define** THRESHOLD1 30

* 1. You need to declare a variable to store the sensor value when it is scanning.

**int** sensorValue = **CheckSensor**(S1);

* 1. You need to configure the sensor in your program (for example in task main)

*ConfigSensor*(S1, SENSOR\_TYPE\_SOUND\_DB,

SENSOR\_MODE\_PERCENT, false);

* 1. Then you use the value of sensorValue (or whatever you called your variable) in your code for comparisons or statements such as:

**If**(sensorValue > THRESHOLD1)

{

MotorsReverse(MOTOR\_C, 75, 0);

}

1. To use the touch sensor:
   1. You need to add the following line at the very top of your program

**#include** "SensorUtilities.nxc"

* 1. You need to declare a variable to store the sensor value when it is scanning.

**int** sensorValue = **CheckSensor**(S1);

* 1. You need to configure the sensor in your program (for example in task main)

***ConfigSensor(S1, SENSOR\_TYPE\_TOUCH,***

***SENSOR\_MODE\_BOOL, false);***

* 1. Then you use the value of sensorValue (or whatever you called your variable) in your code for comparisons or statements such as:

if(sensorValue)

{

*MotorsForward*(MOTOR\_AC, 75, 0);

*Wait(2000);*

*}*

1. To use the Ultrasonic sensor:
   1. You need to add the following line at the very top of your program

**#include** "SensorUtilities.nxc"

* 1. You need to add a THRESHOLD value to test the light sensor against. Add this after any include statements that you have, for example

**#define** THRESHOLD1 30

* 1. You need to declare a variable to store the sensor value when it is scanning.

**int** sensorValue = **CheckSensor**(S1);

* 1. You need to configure the sensor in your program (for example in task main)

***ConfigSensor(S1, SENSOR\_TYPE\_LOWSPEED\_9V,***

***SENSOR\_MODE\_RAW, false);***

* 1. Then you use the value of sensorValue (or whatever you called your variable) in your code for comparisons or statements such as:

**if**(sensorValue > THRESHOLD1)

{

MotorsReverse(MOTOR\_C, 75, 0);

}

Variables, Loops and Conditions

1. To declare a variable and initialize them: *data type name of variable*
   * Ex: int number = 4;
     1. Integers are whole numbers
2. To declare a constant: *#define NAME OF VARIABLE value;*
   * Ex: #define THRESHOLD 40;
3. For a while statement: while (condition) { set of statements}
   * NOTE that if you want an infinite loop then put *while (true)*
   * Ex:

while (turn\_time < 100)

{

MotorsForward(MOTOR\_A, 75, 0););

Wait(2000);

turn\_time = turn\_time + 20;

}

1. For an If Statement: *if(condition){1 or more statements}*
   * if (Random() > 0)

{

MotorsReverse(MOTOR\_AC, 75, 0);

Wait(2000);

}

1. To use do while loop: which means that you are DOing a bunch of code for as long as the WHILE condition is met.
   * Ex:

do

{

move\_time = Random(1000);

MotorsForward(MOTOR\_A, 75, 0);

}

while (move\_time < 800);

1. To play a tone: PlayTone (*frequency, dur*ation)

PlayTone(440, 2000); //play tone for 2 seconds