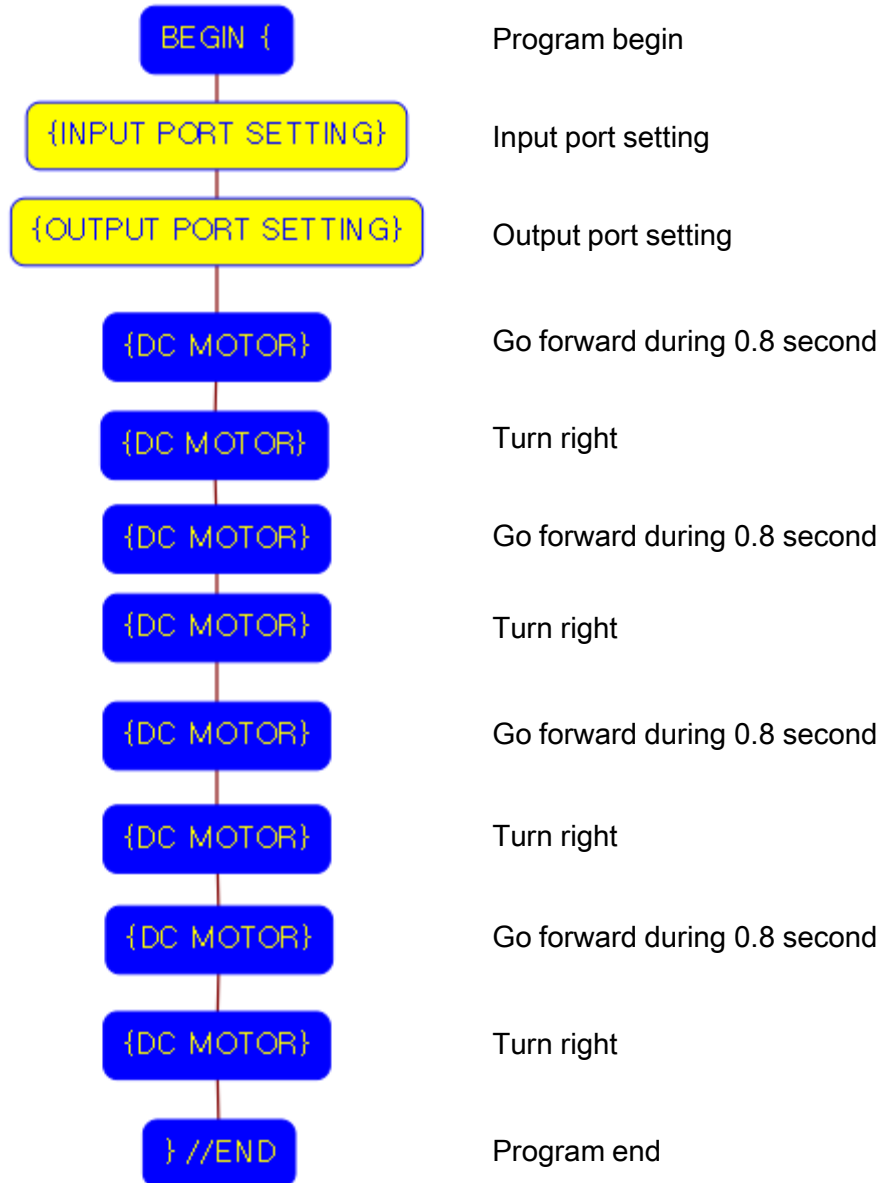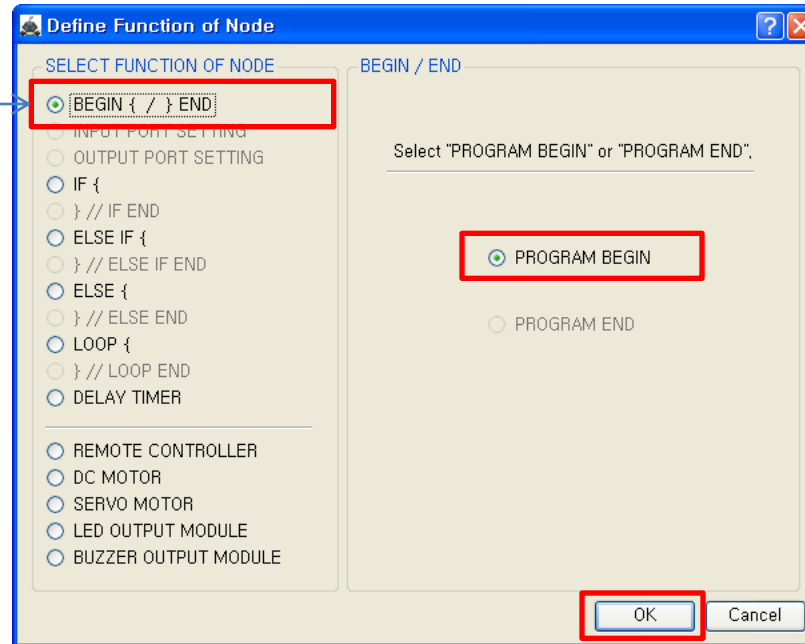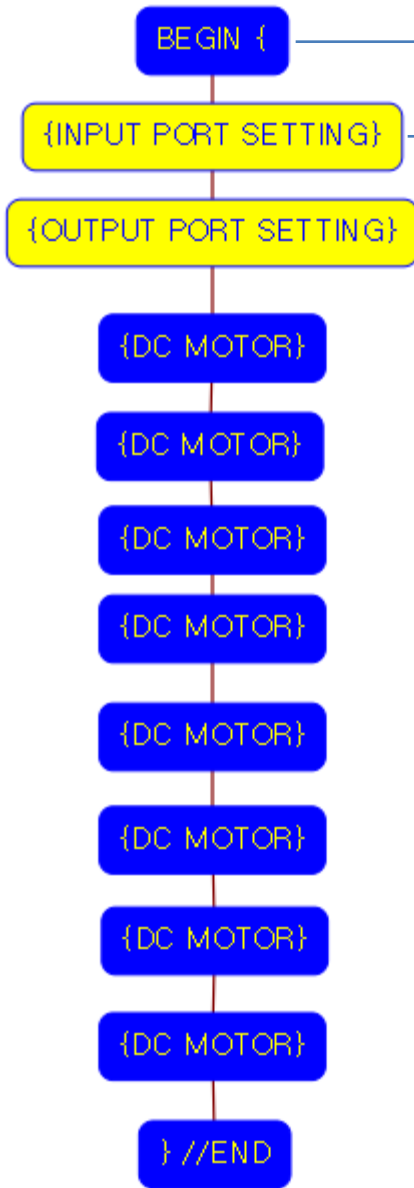| Block	Description
BEGIN {	Program begin
{INPUT PORT SETTING}	Input port setting
{OUTPUT PORT SETTING}	Output port setting
{DC MOTOR}	Go forward during 0.8 second
{DC MOTOR}	Turn right
{DC MOTOR}	Go forward during 0.8 second
{DC MOTOR}	Turn right
{DC MOTOR}	Go forward during 0.8 second
{DC MOTOR}	Turn right
{DC MOTOR}	Go forward during 0.8 second
{DC MOTOR}	Turn right
} //END	Program end

See video at first.
Carrier robot moves along the rectangle path and return to the start point.

You can learn how to program about DC Motor.

Program name : eq2-2-p08_CarrierRobot.ufc

Flowchart nodes (left):

BEGIN {

{INPUT PORT SETTING}

{OUTPUT PORT SETTING}

{DC MOTOR}

{DC MOTOR}

{DC MOTOR}

{DC MOTOR}

{DC MOTOR}

{DC MOTOR}

{DC MOTOR}

{DC MOTOR}

} //END

Dialog (top): Define Function of Node

SELECT FUNCTION OF NODE

- BEGIN { / } END
- INPUT PORT SETTING
- OUTPUT PORT SETTING
- IF {
- } // IF END
- ELSE IF {
- } // ELSE IF END
- ELSE {
- } // ELSE END
- LOOP {
- } // LOOP END
- DELAY TIMER

- REMOTE CONTROLLER
- DC MOTOR
- SERVO MOTOR
- LED OUTPUT MODULE
- BUZZER OUTPUT MODULE

BEGIN / END

Select "PROGRAM BEGIN" or "PROGRAM END".

- PROGRAM BEGIN
- PROGRAM END

OK   Cancel

Dialog (bottom): Define Function of Node

SELECT FUNCTION OF NODE

- BEGIN { / } END
- INPUT PORT SETTING
- OUTPUT PORT SETTING
- IF {
- } // IF END
- ELSE IF {
- } // ELSE IF END
- ELSE {
- } // ELSE END
- LOOP {
- } // LOOP END
- DELAY TIMER

- REMOTE CONTROLLER
- DC MOTOR
- SERVO MOTOR
- LED OUTPUT MODULE
- BUZZER OUTPUT MODULE

INPUT PORT SETTING

INPUT PORT	SENSOR	TRUE VALUE
RCR	REMOTE CONTROLLER RECEIVER	
IN-1	IR-PTR	0
IN-2	IR-PTR	0
IN-3	IR-PTR	0
IN-4	IR-PTR	0
IN-5	IR-PTR	0
IN-6	IR-PTR	0
IN-7	IR-PTR	0

OK   Cancel

Text (right):

This means that program begins from hear.

You have to place this node at the first of program.

"PROGRAM END" is not active because you did not define "PROGRAM BEGIN" yet.
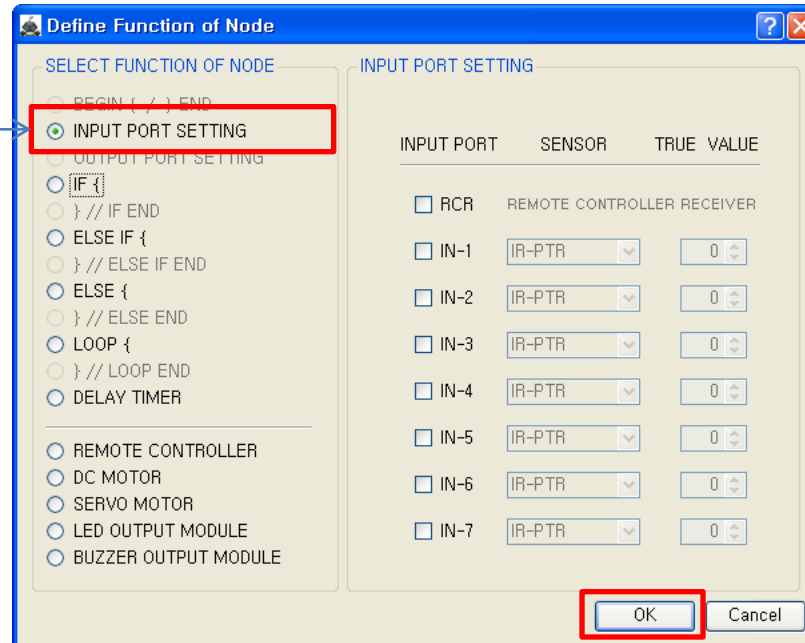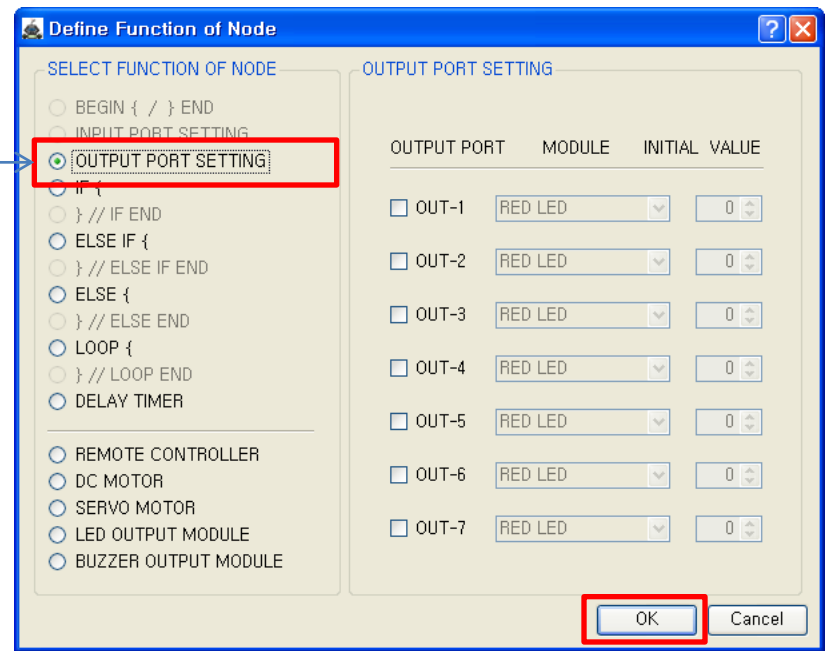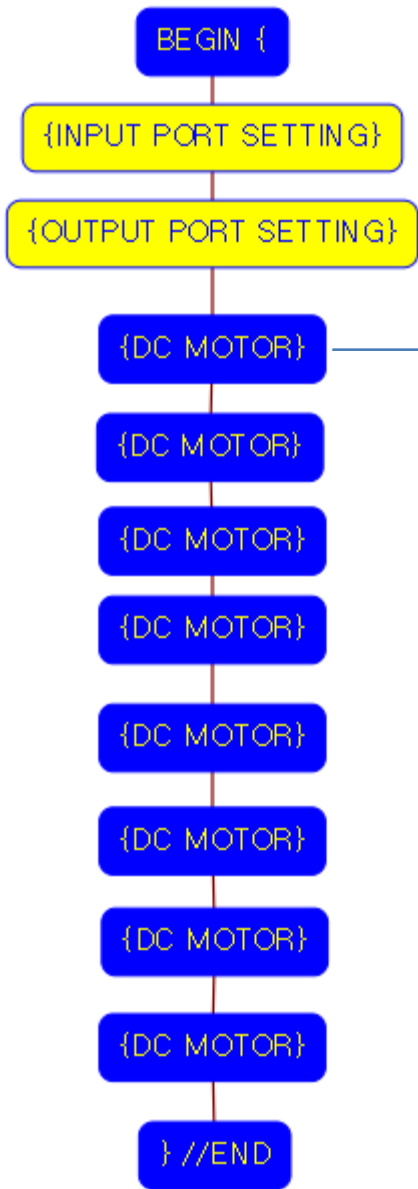
After define the begin of program, we have to define the input and output port setting.

You can define the input port for sensors in hear, "INPUT PORT SETTING".

In carrier robot, we do not use sensors, so we let the robot we do not use.

Click "OK" to finish the setting. The node color is yellow because we did not setting any one.

USER CREATIVE ROBOT

BEGIN {

{INPUT PORT SETTING}

{OUTPUT PORT SETTING}

{DC MOTOR}

{DC MOTOR}

{DC MOTOR}

{DC MOTOR}

{DC MOTOR}

{DC MOTOR}

{DC MOTOR}

{DC MOTOR}

} //END

Define Function of Node

SELECT FUNCTION OF NODE

○ BEGIN { / } END
○ INPUT PORT SETTING
⦿ OUTPUT PORT SETTING
○ IF {
○ } // IF END
○ ELSE IF {
○ } // ELSE IF END
○ ELSE {
○ } // ELSE END
○ LOOP {
○ } // LOOP END
○ DELAY TIMER

○ REMOTE CONTROLLER
○ DC MOTOR
○ SERVO MOTOR
○ LED OUTPUT MODULE
○ BUZZER OUTPUT MODULE

OUTPUT PORT SETTING

OUTPUT PORT   MODULE   INITIAL VALUE

☐ OUT-1   RED LED   0
☐ OUT-2   RED LED   0
☐ OUT-3   RED LED   0
☐ OUT-4   RED LED   0
☐ OUT-5   RED LED   0
☐ OUT-6   RED LED   0
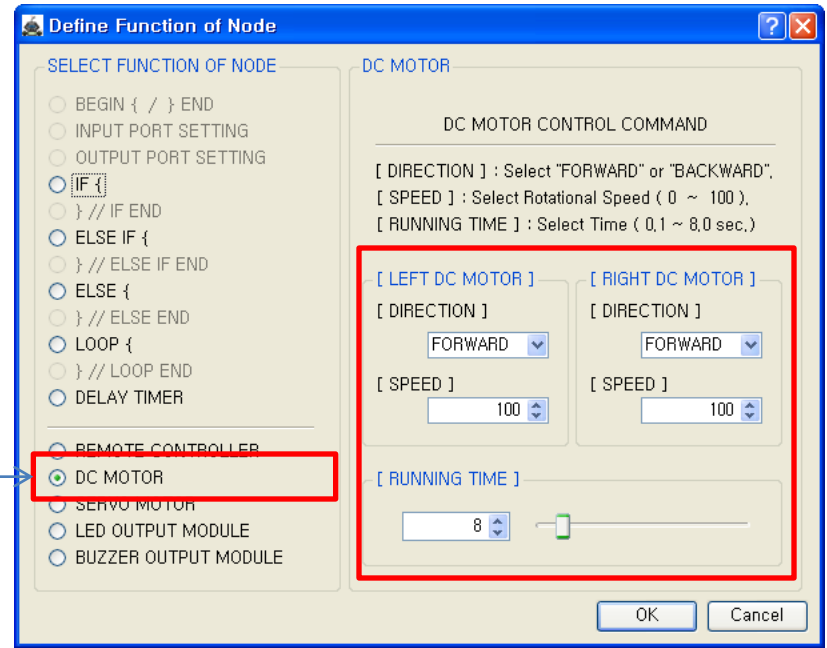☐ OUT-7   RED LED   0

OK   Cancel

You can define the output port for robot in hear, "OUTPUT PORT SETTING".

In carrier robot, we use only DC motors, so we let the robot we don't use any other.

Click "OK" to finish the setting. The node color is yellow because we did not setting any one.

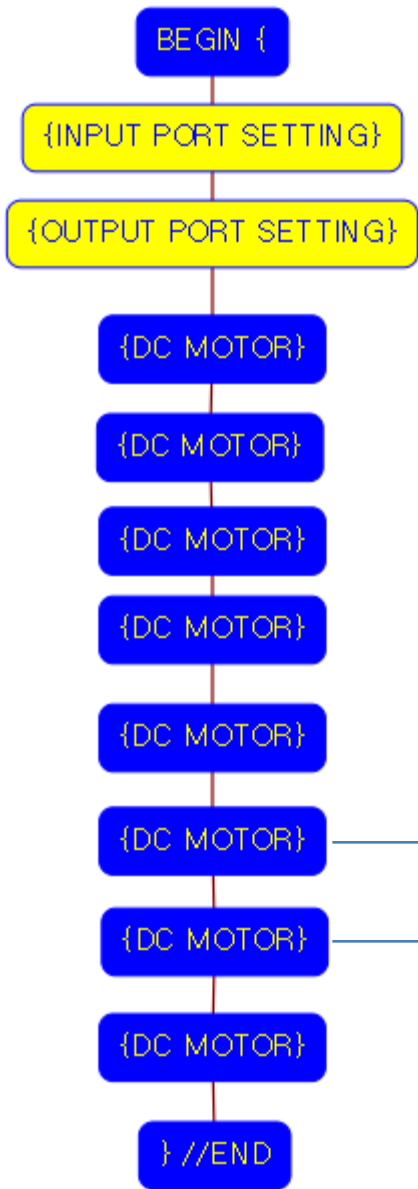After setting the Input / Output, the real program code is writing after this node.

Define Function of Node

SELECT FUNCTION OF NODE

○ BEGIN { / } END
○ INPUT PORT SETTING
○ OUTPUT PORT SETTING
⦿ IF {
○ } // IF END
○ ELSE IF {
○ } // ELSE IF END
○ ELSE {
○ } // ELSE END
○ LOOP {
○ } // LOOP END
○ DELAY TIMER

○ REMOTE CONTROLLER
⦿ DC MOTOR
○ SERVO MOTOR
○ LED OUTPUT MODULE
○ BUZZER OUTPUT MODULE

DC MOTOR

DC MOTOR CONTROL COMMAND

[DIRECTION] : Select "FORWARD" or "BACKWARD",
[SPEED] : Select Rotational Speed (0 ~ 100),
[RUNNING TIME] : Select Time (0.1 ~ 8.0 sec.)

[LEFT DC MOTOR]   [RIGHT DC MOTOR]
[DIRECTION]   [DIRECTION]
FORWARD   FORWARD
[SPEED]   [SPEED]
100   100

[RUNNING TIME]

8

OK   Cancel

To go forward, we order both DC motor go forward and same speed and time.

Both DC Motor
- Direction : Forward
- Speed : 100
- Running Time : 8
➔ Robot goes forward during 0.8 second

Motor speed is from 0 to 100 and running time is based on 0.1 second.
(8 is 0.8 second)

USER **C**REATIVE **R**OBOT

To turn right, we order left DC motor to forward with 95 speed and 0.9 operating time and right motor to stop.
(According to the condition of battery state and friction force between robot and floor, the result differs a little.)

※ If you want robot rotate at the center of robot, you order the right DC motor to backward and same speed and time.

Go forward again.

BEGIN {

{INPUT PORT SETTING}

{OUTPUT PORT SETTING}

{DC MOTOR}

{DC MOTOR}

{DC MOTOR}

{DC MOTOR}

{DC MOTOR}

{DC MOTOR}

{DC MOTOR}

{DC MOTOR}

} //END

Define Function of Node

SELECT FUNCTION OF NODE

○ BEGIN { / } END
○ INPUT PORT SETTING
○ OUTPUT PORT SETTING
○ IF {
○ } // IF END
○ ELSE IF {
○ } // ELSE IF END
○ ELSE {
○ } // ELSE END
○ LOOP {
○ } // LOOP END
○ DELAY TIMER
○ REMOTE CONTROLLER
● DC MOTOR
○ SERVO MOTOR
○ LED OUTPUT MODULE
○ BUZZER OUTPUT MODULE

DC MOTOR

DC MOTOR CONTROL COMMAND

[DIRECTION] : Select "FORWARD" or "BACKWARD",
[SPEED] : Select Rotational Speed (0 ~ 100),
[RUNNING TIME] : Select Time (0.1 ~ 8.0 sec.)

[LEFT DC MOTOR]
[DIRECTION]
FORWARD
[SPEED]
95

[RIGHT DC MOTOR]
[DIRECTION]
FORWARD
[SPEED]
0

[RUNNING TIME]
9

OK   Cancel

Define Function of Node

SELECT FUNCTION OF NODE

○ BEGIN { / } END
○ INPUT PORT SETTING
○ OUTPUT PORT SETTING
○ IF {
○ } // IF END
○ ELSE IF {
○ } // ELSE IF END
○ ELSE {
○ } // ELSE END
○ LOOP {
○ } // LOOP END
○ DELAY TIMER
○ REMOTE CONTROLLER
● DC MOTOR
○ SERVO MOTOR
○ LED OUTPUT MODULE
○ BUZZER OUTPUT MODULE

DC MOTOR

DC MOTOR CONTROL COMMAND

[DIRECTION] : Select "FORWARD" or "BACKWARD",
[SPEED] : Select Rotational Speed (0 ~ 100),
[RUNNING TIME] : Select Time (0.1 ~ 8.0 sec.)

[LEFT DC MOTOR]
[DIRECTION]
FORWARD
[SPEED]
100

[RIGHT DC MOTOR]
[DIRECTION]
FORWARD
[SPEED]
100

[RUNNING TIME]
8

OK   Cancel

BEGIN {

{INPUT PORT SETTING}

{OUTPUT PORT SETTING}

{DC MOTOR}

{DC MOTOR}

{DC MOTOR}

{DC MOTOR}

{DC MOTOR}

{DC MOTOR}

{DC MOTOR}

{DC MOTOR}

} //END

Turn right again

Define Function of Node

SELECT FUNCTION OF NODE

○ BEGIN { / } END
○ INPUT PORT SETTING
○ OUTPUT PORT SETTING
○ IF {
○ } // IF END
○ ELSE IF {
○ } // ELSE IF END
○ ELSE {
○ } // ELSE END
○ LOOP {
○ } // LOOP END
○ DELAY TIMER

○ REMOTE CONTROLLER
◉ DC MOTOR
○ SERVO MOTOR
○ LED OUTPUT MODULE
○ BUZZER OUTPUT MODULE

DC MOTOR

DC MOTOR CONTROL COMMAND

[DIRECTION] : Select "FORWARD" or "BACKWARD".
[SPEED] : Select Rotational Speed (0 ~ 100).
[RUNNING TIME] : Select Time (0.1 ~ 8.0 sec.)

[LEFT DC MOTOR]   [RIGHT DC MOTOR]
[DIRECTION]   [DIRECTION]
FORWARD   FORWARD
[SPEED]   [SPEED]
96   0

[RUNNING TIME]
9

OK   Cancel

Go forward again.

Define Function of Node

SELECT FUNCTION OF NODE

○ BEGIN { / } END
○ INPUT PORT SETTING
○ OUTPUT PORT SETTING
○ IF {
○ } // IF END
○ ELSE IF {
○ } // ELSE IF END
○ ELSE {
○ } // ELSE END
○ LOOP {
○ } // LOOP END
○ DELAY TIMER

○ REMOTE CONTROLLER
◉ DC MOTOR
○ SERVO MOTOR
○ LED OUTPUT MODULE
○ BUZZER OUTPUT MODULE

DC MOTOR

DC MOTOR CONTROL COMMAND

[DIRECTION] : Select "FORWARD" or "BACKWARD".
[SPEED] : Select Rotational Speed (0 ~ 100).
[RUNNING TIME] : Select Time (0.1 ~ 8.0 sec.)

[LEFT DC MOTOR]   [RIGHT DC MOTOR]
[DIRECTION]   [DIRECTION]
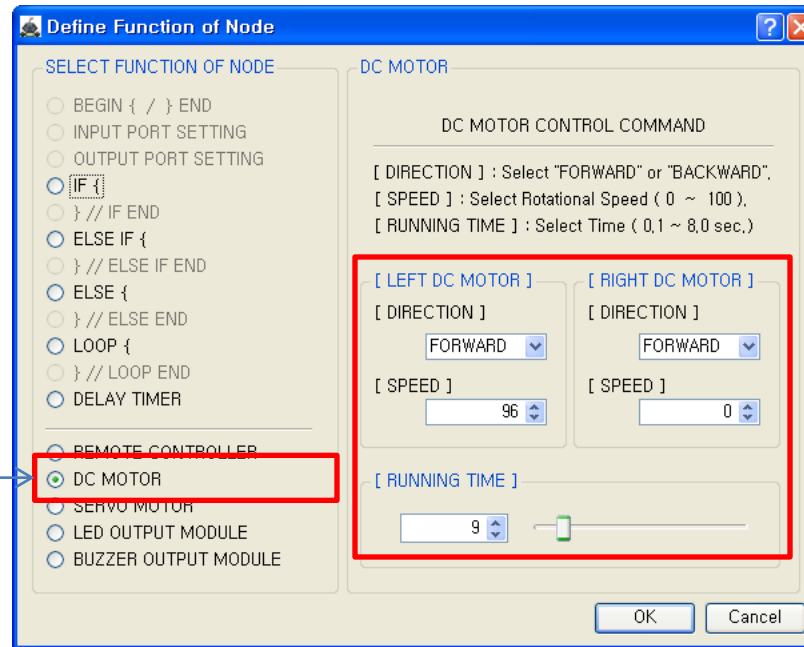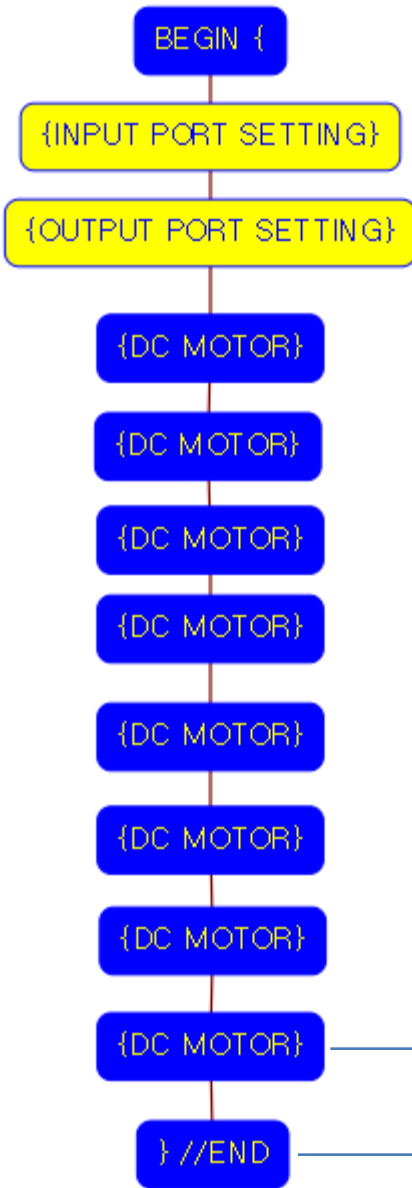FORWARD   FORWARD
[SPEED]   [SPEED]
100   100

[RUNNING TIME]
8

OK   Cancel

USER **C**REATIVE **R**OBOT

Flowchart (left):
BEGIN {
{INPUT PORT SETTING}
{OUTPUT PORT SETTING}
{DC MOTOR}
{DC MOTOR}
{DC MOTOR}
{DC MOTOR}
{DC MOTOR}
{DC MOTOR}
{DC MOTOR}
} //END

Define Function of Node (top dialog)

SELECT FUNCTION OF NODE
- BEGIN { / } END
- INPUT PORT SETTING
- OUTPUT PORT SETTING
- IF {
- } // IF END
- ELSE IF {
- } // ELSE IF END
- ELSE {
- } // ELSE END
- LOOP {
- } // LOOP END
- DELAY TIMER
- REMOTE CONTROLLER
- ● DC MOTOR
- SERVO MOTOR
- LED OUTPUT MODULE
- BUZZER OUTPUT MODULE

DC MOTOR

DC MOTOR CONTROL COMMAND

[DIRECTION] : Select "FORWARD" or "BACKWARD",
[SPEED] : Select Rotational Speed (0 ~ 100),
[RUNNING TIME] : Select Time (0.1 ~ 8.0 sec.)

[LEFT DC MOTOR]
[DIRECTION]
FORWARD
[SPEED]
96

[RIGHT DC MOTOR]
[DIRECTION]
FORWARD
[SPEED]
0

[RUNNING TIME]
9

OK   Cancel

Define Function of Node (bottom dialog)

SELECT FUNCTION OF NODE
- ● BEGIN { / } END
- INPUT PORT SETTING
- OUTPUT PORT SETTING
- IF {
- } // IF END
- ELSE IF {
- } // ELSE IF END
- ELSE {
- } // ELSE END
- LOOP {
- } // LOOP END
- DELAY TIMER
- REMOTE CONTROLLER
- DC MOTOR
- SERVO MOTOR
- LED OUTPUT MODULE
- BUZZER OUTPUT MODULE

BEGIN / END

Select "PROGRAM BEGIN" or "PROGRAM END".

- PROGRAM BEGIN
- ● PROGRAM END

OK   Cancel

Turn right again.

According to many reason(battery, friction force, floor state, the center of gravity, symmetry), robot can not return to the start point exactly.
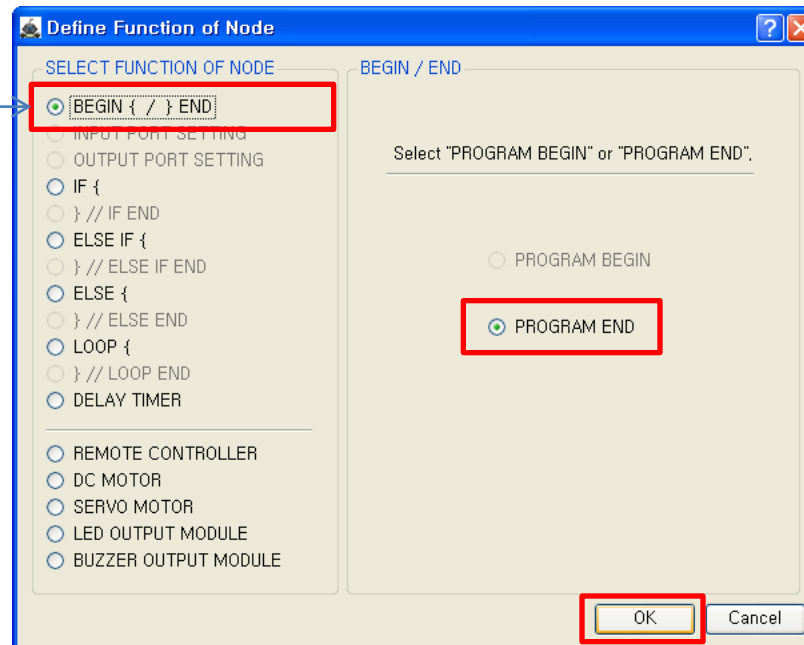
This means that program ends hear.

You have to place this node at the end of program.

"PROGRAM BEGIN" is not active because you already define at the program

To run the robot, it is necessary to download the program into the robot. (Refer to download manual)