Báo cáo Tuần 10 (phần 2)

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Bài 1:

Điều khiển marsbot di chuyển theo:

1. Hình tam giác đều

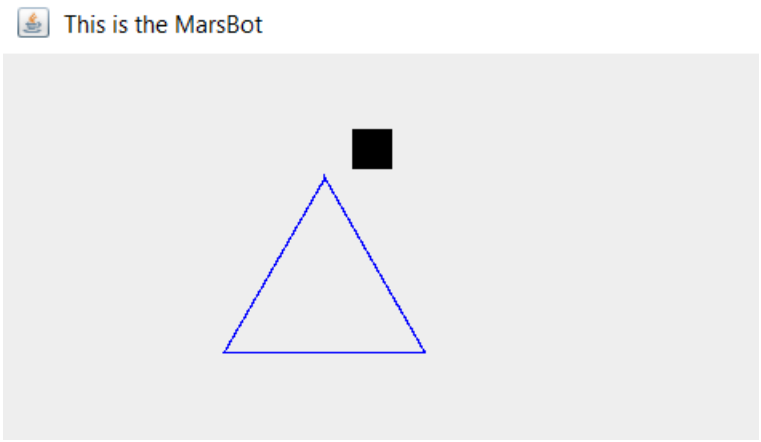
```
.eqv  HEADING    0xffff8010         # Integer: An angle between 0 and 359
                                    # 0 : North (up)
                                    # 90: East (right)
                                    # 180: South (down)
                                    # 270: West  (left)
.eqv  MOVING     0xffff8050         # Boolean: whether or not to move
.eqv  LEAVETRACK 0xffff8020         # Boolean (0 or non-0):
                                    #    whether or not to leave a track
.eqv  WHEREX     0xffff8030         # Integer: Current x-location of MarsBot
.eqv  WHEREY     0xffff8040         # Integer: Current y-location of MarsBot
.text
main:  jal  TRACK                   # draw trackline
       addi  $a0, $zero, 90         # Marsbot rotates 90* and start running
       jal   ROTATE
       jal   GO
sleep0: addi    $v0,$zero,32        # Keep running by sleeping in1000 ms
       li  $a0,8000
       syscall
```

```
        jal     UNTRACK           # keep old track
        #jal     TRACK            # and draw new track line

        #jal  TRACK               # draw trackline
        addi  $a0, $zero, 180  # Marsbot rotates 180* and start
running
        jal   ROTATE
        jal   GO
sleep1: addi    $v0,$zero,32    # Keep running by sleeping in3000
ms
        li  $a0,3000
        syscall
        jal     UNTRACK           # keep old track
        jal     TRACK             # and draw new track line

goASKEWRIGHT: addi    $a0, $zero, 150        # Marsbot rotates
150*
        jal     ROTATE
sleep2: addi $v0,$zero,32  # Keep running by sleeping in 5000 ms
        li     $a0,5000
        syscall
        jal     UNTRACK        # keep old track
        jal     TRACK         # and draw new track line
goLEFT: addi  $a0, $zero, 270       # Marsbotrotates 270*
        jal   ROTATE
sleep3: addi    $v0,$zero,32    # Keep running by sleeping in 5000
ms
        li     $a0,5000
        syscall
        jal     UNTRACK        # keep old track
        jal     TRACK         # anddraw new track line

goASKEWLEFT:addi  $a0, $zero, 30       # Marsbot rotates 30*
```

```
        jal   ROTATE
sleep4: addi    $v0,$zero,32    # Keep running by sleeping in 5000
ms
        li      $a0,5000
        syscall
        jal     UNTRACK         # keep old track
        #jal     TRACK          # and draw new track line
end_main:
        li $v0,10
        syscall
#---------------------------------------------------------
# GO procedure, to start running
# param[in]    none
#---------------------------------------------------------
GO:     li    $at, MOVING     # change MOVING port
        addi  $k0, $zero,1    # to  logic 1,
        sb    $k0, 0($at)     # to start running
        jr    $ra
#---------------------------------------------------------
# STOP procedure, to stop running
# param[in]    none
#---------------------------------------------------------
STOP:   li    $at, MOVING     # change MOVING port to 0
        sb    $zero, 0($at)   # to stop
        jr    $ra
#---------------------------------------------------------
# TRACK procedure, to start drawing line
# param[in]    none
#---------------------------------------------------------
TRACK:  li    $at, LEAVETRACK # change LEAVETRACK port
        addi  $k0, $zero,1    # to  logic 1,
        sb    $k0, 0($at)     # to start tracking
        jr    $ra
```

```
#-----------------------------------------------------------
# UNTRACK procedure, to stop drawing line# param[in]    none
#-----------------------------------------------------------
UNTRACK:li    $at, LEAVETRACK # change LEAVETRACK port to 0
        sb    $zero, 0($at)   # to stop drawing tail
        jr    $ra
#-----------------------------------------------------------
# ROTATE procedure, to rotate the robot
# param[in]    $a0, An angle between 0 and 359
#                0 : North (up)
#                90: East  (right)
#               180: South (down)
#               270: West  (left)
#-----------------------------------------------------------
ROTATE: li    $at, HEADING    # change HEADING port
        sw    $a0, 0($at)     # to rotate robot
        jr    $ra
```

Kết quả:



2.Hình vuông:

```
    .eqv  HEADING    0xffff8010    # Integer: An angle between 0 and 359
        # 0 : North (up)
        # 90: East (right)
        # 180: South (down)
        # 270: West  (left)
        .eqv  MOVING     0xffff8050   # Boolean: whether or not to move
        .eqv  LEAVETRACK 0xffff8020
        # Boolean (0 or non-0):
        #    whether or not to leave a track
        .eqv  WHEREX     0xffff8030    # Integer: Current x-location of MarsBot
        .eqv  WHEREY     0xffff8040    # Integer: Current y-location of MarsBot
        .text
        main:
        addi  $a0, $zero, 135          # Marsbot rotates 90* and start running
        jal   ROTATE
        jal   GO
        sleep1: addi    $v0,$zero,32    # Keep running by sleeping in1000 ms
        li  $a0,2000
```

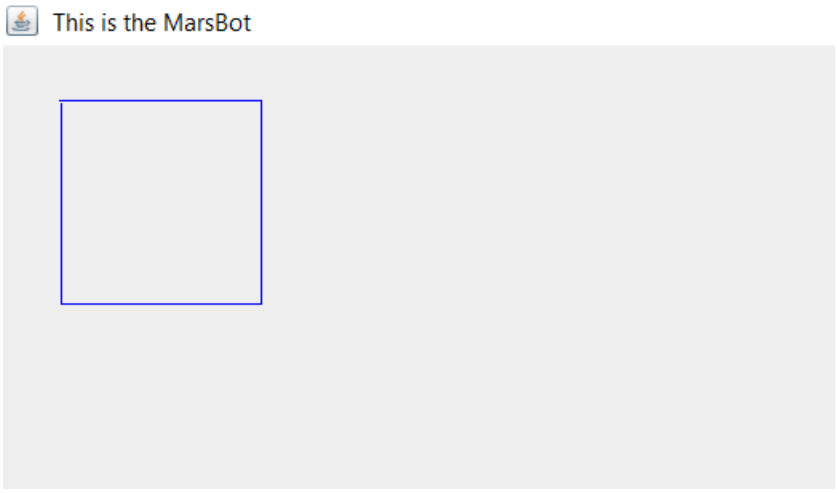
```
        syscall
        jal     TRACK# and draw new track line
        goRIGHT: addi    $a0, $zero, 90# Marsbot rotates 180*
        jal     ROTATE
        sleep2: addi $v0,$zero,32  # Keep running by sleeping in 2000 ms
        li      $a0,5000
        syscall
        jal     UNTRACK        # keep old track
        jal     TRACK          # and draw new track line
        goDOWN: addi  $a0, $zero, 180# Marsbotrotates 270*
        jal   ROTATE
        sleep3: addi    $v0,$zero,32    # Keep running by sleeping in 1000
ms
        li      $a0,5000
        syscall
        jal     UNTRACK        # keep old track
        jal     TRACK          # anddraw new track line
        goLEFT: addi  $a0, $zero, 270# Marsbotrotates 270*
        jal   ROTATE
        sleep4: addi    $v0,$zero,32    # Keep running by sleeping in 1000
ms
        li      $a0,5000
        syscall
        jal     UNTRACK        # keep old track
```

```
        jal     TRACK           # anddraw new track line
        goUP: addi  $a0, $zero, 0# Marsbotrotates 270*
        jal   ROTATE
        sleep5: addi    $v0,$zero,32    # Keep running by sleeping in 1000
ms
        li      $a0,5000
        syscall
        jal     UNTRACK         # keep old track


        end_main:
                li $v0, 10#exit
                syscall
        #---------------------------------------------------------
        # GO procedure, to start running
        # param[in]    none
        #---------------------------------------------------------
        GO:     li    $at, MOVING     # change MOVING port
        addi  $k0, $zero,1    # to  logic 1,
        sb    $k0, 0($at)     # to start running
        jr    $ra
        #---------------------------------------------------------
        # STOP procedure, to stop running
        # param[in]    none
        #---------------------------------------------------------
```

```
STOP:   li    $at, MOVING     # change MOVING port to 0
sb    $zero, 0($at)   # to stop
jr    $ra
#-----------------------------------------------------------
# TRACK procedure, to start drawing line
# param[in]    none
#-----------------------------------------------------------
TRACK:  li    $at, LEAVETRACK # change LEAVETRACK port
addi  $k0, $zero,1    # to  logic 1,
sb    $k0, 0($at)     # to start tracking
jr    $ra
#-----------------------------------------------------------
# UNTRACK procedure, to stop drawing line
# param[in]    none
#-----------------------------------------------------------
UNTRACK:li    $at, LEAVETRACK # change LEAVETRACK port to 0
sb    $zero, 0($at)   # to stop drawing tail
jr    $ra
#-----------------------------------------------------------
# ROTATE procedure, to rotate the robot
# param[in]    $a0, An angle between 0 and 359
#              0 : North (up)
#              90: East  (right)
```

```
#               180: South (down)
#               270: West  (left)
#-------------------------------------------------------
ROTATE: li    $at, HEADING    # change HEADING port
sw    $a0, 0($at)     # to rotate robot
jr    $ra
```

Kết quả:



3.Hình sao:

```
.eqv  HEADING    0xffff8010    # Integer: An angle between 0 and 359
# 0 : North (up)
# 90: East (right)
# 180: South (down)
# 270: West  (left)
.eqv  MOVING     0xffff8050   # Boolean: whether or not to move
.eqv  LEAVETRACK 0xffff8020
# Boolean (0 or non-0):
```

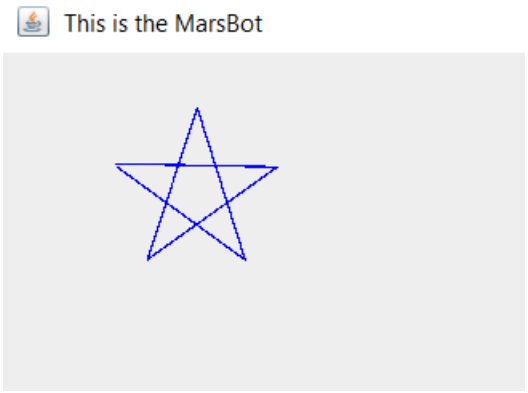
```
#    whether or not to leave a track
.eqv  WHEREX     0xffff8030    # Integer: Current x-location of MarsBot
.eqv  WHEREY     0xffff8040    # Integer: Current y-location of MarsBot
.text
main:
addi  $a0, $zero, 135          # Marsbot rotates 135* and start running
jal   ROTATE
jal   GO
sleep1: addi    $v0,$zero,32    # Keep running by sleeping in4000 ms
li  $a0,4000
syscall
jal     TRACK# and draw new track line
go1: addi    $a0, $zero, 90# Marsbot rotates 90*
jal     ROTATE
sleep2: addi $v0,$zero,32  # Keep running by sleeping in 4000 ms
li      $a0,4000
syscall
jal     UNTRACK        # keep old track
jal     TRACK          # and draw new track line
go2: addi  $a0, $zero, 234# Marsbotrotates 234*
jal   ROTATE
sleep3: addi    $v0,$zero,32    # Keep running by sleeping in 4000 ms
li      $a0,4000
```

```
syscall
jal     UNTRACK        # keep old track
jal     TRACK          # anddraw new track line
go3: addi  $a0, $zero, 18 # Marsbotrotates 18*
jal   ROTATE
sleep4: addi    $v0,$zero,32    # Keep running by sleeping in 4000 ms
li      $a0,4000
syscall
jal     UNTRACK        # keep old track
jal     TRACK          # anddraw new track line
go4: addi  $a0, $zero, 162# Marsbotrotates 162*
jal   ROTATE
sleep5: addi    $v0,$zero,32    # Keep running by sleeping in 4000 ms
li      $a0,4000
syscall
jal     UNTRACK        # keep old track
jal     TRACK          # anddraw new track line
go5: addi  $a0, $zero, 306# Marsbotrotates 306*
jal   ROTATE
sleep6: addi    $v0,$zero,32    # Keep running by sleeping in 4000 ms
li      $a0,4000
syscall
jal     UNTRACK        # keep old track
```

```
end_main:
        li $v0, 10#exit
        syscall
#-----------------------------------------------------
# GO procedure, to start running
# param[in]    none
#-----------------------------------------------------
GO:     li    $at, MOVING     # change MOVING port
addi  $k0, $zero,1    # to  logic 1,
sb    $k0, 0($at)     # to start running
jr    $ra
#-----------------------------------------------------
# STOP procedure, to stop running
# param[in]    none
#-----------------------------------------------------
STOP:   li    $at, MOVING     # change MOVING port to 0
sb    $zero, 0($at)   # to stop
jr    $ra
#-----------------------------------------------------
# TRACK procedure, to start drawing line
# param[in]    none
#-----------------------------------------------------
```

```
TRACK:  li    $at, LEAVETRACK # change LEAVETRACK port
addi  $k0, $zero,1    # to  logic 1,
sb    $k0, 0($at)     # to start tracking
jr    $ra
#-----------------------------------------------------
# UNTRACK procedure, to stop drawing line
# param[in]    none
#-----------------------------------------------------
UNTRACK:li    $at, LEAVETRACK # change LEAVETRACK port to 0
sb    $zero, 0($at)   # to stop drawing tail
jr    $ra
#-----------------------------------------------------
# ROTATE procedure, to rotate the robot
# param[in]    $a0, An angle between 0 and 359
#                0 : North (up)
#                90: East  (right)
#               180: South (down)
#               270: West  (left)
#-----------------------------------------------------
ROTATE: li    $at, HEADING    # change HEADING port
sw    $a0, 0($at)     # to rotate robot
jr    $ra
```

Kết quả:



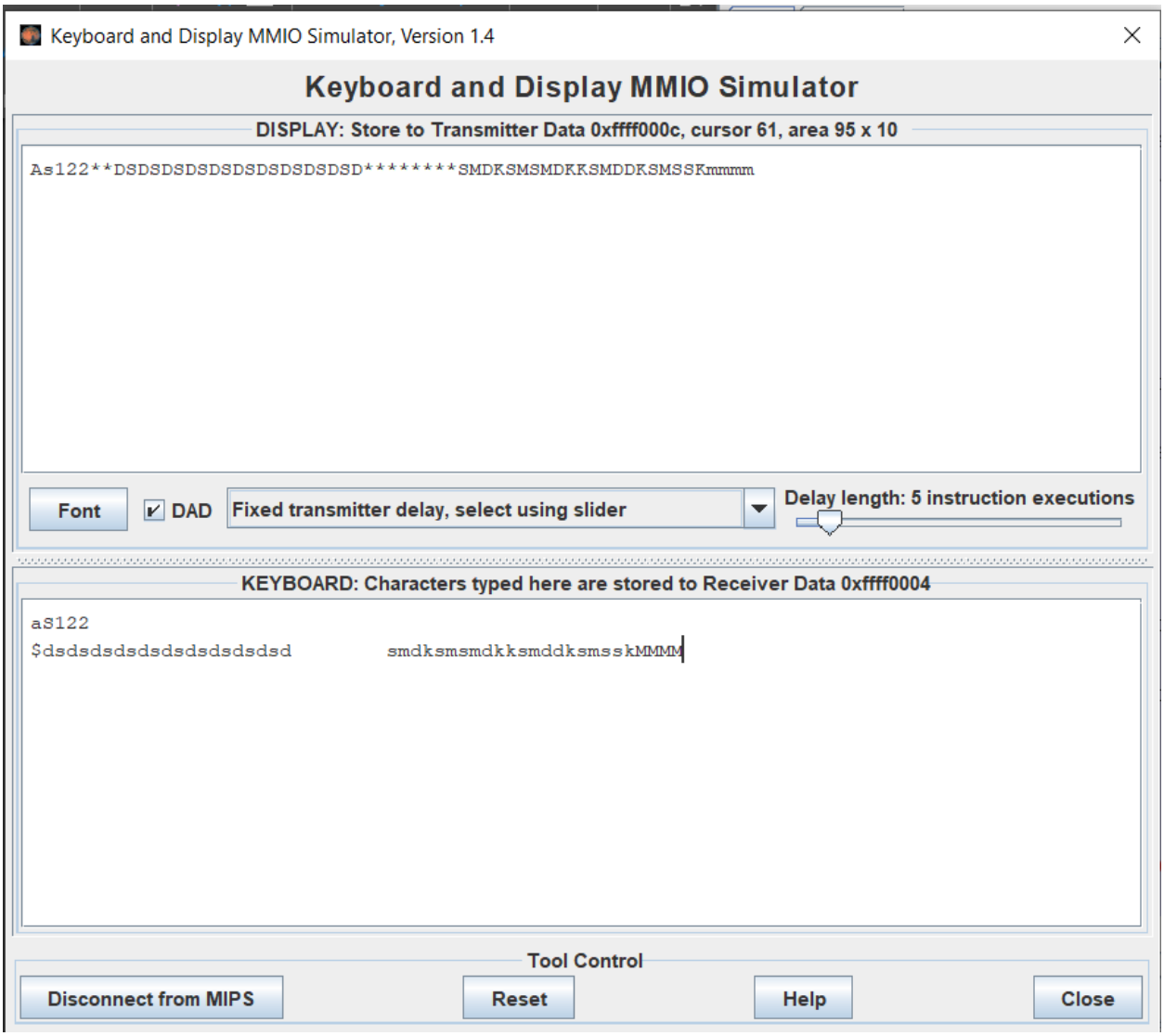
Bài 2:

```
.eqv KEY_CODE   0xFFFF0004      # ASCII code from keyboard, 1 byte
.eqv KEY_READY  0xFFFF0000      # =1 if has a new keycode ?
                                #Auto clear after lw
.eqv DISPLAY_CODE   0xFFFF000C  # ASCII code to show, 1 byte
.eqv DISPLAY_READY  0xFFFF0008  # =1 if the display has already to do
                                # Auto clear after sw
.text
        li $k0,  KEY_CODE
        li $k1,  KEY_READY
        li $s0, DISPLAY_CODE
        li $s1, DISPLAY_READY
loop:       nop
WaitForKey:  lw $t1, 0($k1)         # $t1 = [$k1] = KEY_READY
        beq $t1, $zero, WaitForKey # if $t1 == 0 then Polling
ReadKey:    lw $t0, 0($k0)          # $t0 =[$k0] = KEY_CODE
```

```
WaitForDis:  lw $t2, 0($s1)          # $t2 = [$s1] = DISPLAY_READY
        beq $t2, $zero, WaitForDis # if $t2 == 0 then Polling
Encrypt:
toUpper:
        li $t1, 'a'
        blt $t0,$t1,toLower
        bge $t0,123, defautl
        addi $t0,$t0,-32
        j ShowKey

toLower:
        li $t4,91
        bge $t0,$t4,defautl
        li $t2,'A'
        blt $t0,$t2, number
        addi $t0,$t0,32
        j ShowKey
number:
        li $t3,58
        bge $t0,$t3,defautl
        li $t2,'0'
        blt $t0,$t2,defautl
        j ShowKey
```

```
defautl:
        li $t0,'*'
        j ShowKey
ShowKey:    sw $t0, 0($s0)# show key
        nop
        j loop
```

Kết quả:



Bài 3:

Mã nguồn :

```
.eqv HEADING 0xffff8010 # Integer: An angle between 0 and 359
# 0 : North (up)
# 90: East (right)
# 180: South (down)
# 270: West (left)
.eqv MOVING 0xffff8050 # Boolean: whether or not to move
.eqv LEAVETRACK 0xffff8020 # Boolean (0 or non-0):
# whether or not to leave a track
.eqv WHEREX 0xffff8030 # Integer: Current x-location ofMarsBot
.eqv WHEREY 0xffff8040 # Integer: Current y-location ofMarsBot

main:
addi $a0, $zero, 90 # Marsbot rotates 90* and startrunning
jal ROTATE
jal TRACK
jal GO

li $s1,'w' #w
li $s2,'a' #a
li $s3,'d' #d
li $s4,'s' #s
```

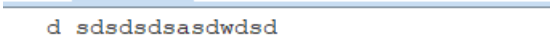
```
li $s5, 32
toStart:	nop
		li $v0,12
		syscall
		add $a1,$zero,$v0

		beq $a1,$s5,pause
		lw $t8, MOVING
		beq $t8,$zero,toStart
		beq $a1,$s1, toUp
		beq $a1,$s2,toLeft
		beq $a1,$s3,toRight
		beq $a1,$s4,toDown

jal TRACK # draw track line
toUp:
		addi $a0, $zero, 0 # Marsbot rotates 0* and startrunning
		jal ROTATE
		jal UNTRACK # keep old track
		jal TRACK # and draw new track line
		j toStart
toDown:
		addi $a0, $zero, 180 # Marsbot rotates 180* and startrunning
```

```
        jal ROTATE
        jal UNTRACK # keep old track
        jal TRACK # and draw new track line
        j toStart
toRight:
        addi $a0, $zero, 90 # Marsbot rotates 90* and startrunning
        jal ROTATE
        jal UNTRACK # keep old track
        jal TRACK # and draw new track line
        j toStart
toLeft:
        addi $a0, $zero, 270 # Marsbot rotates 270* and startrunning
        jal ROTATE
        jal UNTRACK # keep old track
        jal TRACK # and draw new track line
        j toStart
pause:
        lw $t1, MOVING
        beq $t1,$zero,GO
        li $t2,1
        beq $t1,$t2,STOP
        j toStart
end_main:
```

```
#-----------------------------------------------------
# GO procedure, to start running
# param[in]    none
#-----------------------------------------------------
GO:    li    $at, MOVING     # change MOVING port
       addi  $k0, $zero,1    # to  logic 1,
       sb    $k0, 0($at)     # to start running
       jr    $ra
#-----------------------------------------------------
# STOP procedure, to stop running
# param[in]    none
#-----------------------------------------------------
STOP:  li    $at, MOVING     # change MOVING port to 0
       sb    $zero, 0($at)   # to stop
       jr    $ra
#-----------------------------------------------------
# TRACK procedure, to start drawing line
# param[in]    none
#-----------------------------------------------------
TRACK:  li    $at, LEAVETRACK # change LEAVETRACK port
       addi  $k0, $zero,1    # to  logic 1,
       sb    $k0, 0($at)     # to start tracking
       jr    $ra
```

```
#-----------------------------------------------------
# UNTRACK procedure, to stop drawing line# param[in]    none
#-----------------------------------------------------
UNTRACK:li    $at, LEAVETRACK # change LEAVETRACK port to 0
        sb    $zero, 0($at)   # to stop drawing tail
        jr    $ra
#-----------------------------------------------------
# ROTATE procedure, to rotate the robot
# param[in]    $a0, An angle between 0 and 359
#               0 : North (up)
#               90: East  (right)
#              180: South (down)
#              270: West  (left)
#-----------------------------------------------------
ROTATE: li    $at, HEADING    # change HEADING port
        sw    $a0, 0($at)     # to rotate robot
        jr    $ra
```

*Kết quả:



Nhập dãy:

Hiển thị: