

Project grammar

$$G = (N, T, P, \Sigma)$$

$$N = \{seq, moves, instr\}$$

$$T = \{begin, end, north, south, east, west, \epsilon\}$$

$$\Sigma \rightarrow seq$$

$$P : seq \rightarrow begin\ moves\ end$$

$$moves \rightarrow instr\ moves$$

$$moves \rightarrow \epsilon$$

$$instr \rightarrow north \mid south \mid east \mid west$$

Project grammar + semantic actions

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```
seq → begin  errNum = 0,  x = 0x,  y = 0y  
        print("(" + 0x + ", " + 0y + ")\n") moves  
        end  displacement = sqrt(pow(x,2) + pow(y,2))  
        print("L = " + distance + "\n" + "D = " + displacement)
```

```
moves → instr moves
```

```
moves → ε
```

```
instr → north flag = true, errNum++, y += 1  
        for i = 0 to N-1  
            if (x == array[i][0] && y == [i][1])  
                y -= 1  
                print("Error in instr " + errNum + "\n")  
                flag = false  
            if (y > Uy)  
                y -= 1  
                print("Error in instr " + errNum + "\n")  
                flag = false  
            if (flag == true)  
                distance++  
                print("(" + x + ", " + y + ")\n")
```

```

instr → south  flag = true, errNum++, y -= 1
for i = 0 to N-1
    if (x == array[i][0] && y == array[i][1])
        y += 1
        print ("Error in instr " + errNum + "\n")
        flag = false
    if (y < Ly)
        y += 1
        print ("Error in instr " + errNum + "\n")
        flag = false
    if (flag == true)
        distanse++
        print("(" + x + ">" + y + ") \n")

```

```

instr → east  flag = true, errNum++, x += 1
for i = 0 to N-1
    if (x == array[i][0] && y == array[i][1])
        x -= 1
        print ("Error in instr " + errNum + "\n")
        flag = false
    if (x > Ux)
        x -= 1
        print ("Error in instr " + errNum + "\n")
        flag = false

```


distance++

print("(" + x + ", " + y + ")\n")

instr → west flag = true, errNum++, x--

for i=0 to N-1

if (x == array[i][0] && y == array[i][1])

x += 1

print("Error in instr " + errNum + "\n")

flag = false

if (x < Lx)

x += 1

print("Error in instr " + errNum + "\n")

flag = false

if (flag == true)

distance++

print("(" + x + ", " + y + ")\n")