LECTURE 3

Sequential

Counting loops

Figure 1:

1)

repeat 20 times: ahead

right

repeat 20 times: ahead

2)

While not at x

Ahead

Else, right

Figure 2:

1)

Repeat if not at final destination

If at turning point, right

Else, ahead

Figure 3. A>>>>>>B

Repeat s1+s2 times: ahead

While not at destination

Ahead

A>>>>>>C

Repeat s1 times: ahead

Right

Repeat s5 times: ahead

Left

Repeat s4 times: ahead

While not at x

Ahead

Right

While not at y

Ahead

Left

While not at destination

Ahead

Figure 4:

1)  
repeat if not at final destination

If at turning point W or X, right

Else, ahead

2)  
repeat if not at final destination

If at turning point Y or Z, right

Else, ahead

LECTURE 4

Two main concepts: variables & statement

Variables: start from value and can change value

ex. Input in

x = in

x= x\*2

output x

Statements: basic & flow

Basic(2): 1. assign values to variable

ex. x =x \*2 (variable = assignment)

the value on the right is assigned to the variable on the left.

2. invoke procedures

Flow(4): sequential & conditional & repetition (counting & conditional) & concurrent

Programming-----2 steps: algorithm design (English and structure) & coding (programming language)

Pseudo-Code

#Sequential statements

ex. input = z………….2

x = 4 (respect it)

y = z……………..2

a = x\* x……….16

b=y \* y \* y………8

c= a/b……………2

output c

#Conditional statements: to execute different sets of instructions depending on a condition

ex. x = input

if x is even (jump it)

x = x/2

end if

y = x\*3

#Two statements: you have more than one thing to do**.!!! ZERO IS EVEN!!!**

#Two options

#More than two options: you only do one option

#Repetition statement: (a loop may execute 0 of more times depending on the condition)

loop for a number of times

x = input

for i = 1 to 5……….x = 2>>3>>5>>8>>12>>17

x = x + i…………..i= 1>>2>>3>>4>>5

end for

loop wile a condition is true

x = input

while x < 10

x = x \* 2

end while……x = 2>>4>>8>>16

loop while a condition is true, but execute at least once

#Concurrent: execute one or more sets of instructions at the same time (do together)

x = input

y = input

if x > y

output x

else

output y

b.

input x

input y

while x ≠ y

If x > y

output x

else…………………..…..else if y > x

output y…….……………output y

end if………………….……...else

else output “same”………..…..output “same”

end if

c.

input x

input y

for i = x+1……………………for i = x to y

x = x+i………………………..output i

end