Name \_\_\_\_\_KEY\_\_\_\_\_\_

**CS112**

**Exam 2**

1. **[3 points each]** Mark each of the following statements as either True or False. You may explain your answers.

**\_\_T\_\_\_** NetLogo programs are usually used to control agents called turtles.

**\_\_\_T\_\_** In NetLogo other “breeds” of turtle can be defined.

**\_\_F\_\_\_** In NetLogo the only variables that a programmer can create are new breeds of turtles.

**\_\_F\_\_\_ A** NetLogo program must be properly indented to run.

**\_\_F\_\_\_** A conditional is a command that allows a program to do the same thing over and over again.

**\_\_T\_\_\_** In NetLogo the commands **hatch** and **sprout** can be used to create new turtles.

**\_\_T\_\_\_** The environment that NetLogo turtles move in is divided into *patches*.

\_\_**F**\_\_\_ All NetLogo programs must have a block of code (a procedure) called **go**.

1. **[9 points]** List three characteristics that all NetLogo turtle have. For example, turtles have a heading. List three more.

Shape, color, position, size

1. **[9 point**s] List three user controls/interface objects that can be pasted into a NetLogo program. For example, you can create an on/off switch. List three more.

Button, slider, plot, monitor, chooser, output

**4) [4 points each]** Multiple choice, put the letter of the correct answer in the blank to the left of the problem.

\_b\_\_ In NetLogo comments are used

1. Because they are required to make a program run
2. To make a program easier for humans to read
3. To make a program easier for the computer to read
4. All of the above

\_b\_\_ The command/keyword used to start a procedure in NetLogo is:

1. stop
2. to
3. if
4. end

\_h\_\_ The command/keyword used to end a procedure in NetLogo is:

1. stop
2. to
3. if
4. end

\_d\_\_ In NetLogo a set of square brackets [] are used to

1. Define a set of commands to be applied to newly created turtles.
2. Define a set of commands to be applied if a certain condition is true.
3. Define a set of commands to be applied if a certain condition is false.
4. All of the above.

\_b\_\_ In NetLogo every turtle

1. Is on its own patch that no other turtles can be on.
2. Has its own heading.
3. Has its own breed that isn’t shared by any other turtles.
4. Has a unique shape.

\_c\_\_ Which of the following statements is true regarding the following block of NetLogo code:

**ask zombies [set heading towards min-one-of humans [distance myself]]**

1. It will make all zombies point toward the lowest numbered human
2. It will make zombies on the current patch point toward the nearest human not on the same patch
3. It will cause the program to crash (stop running) if there are no humans
4. It will cause the program to crash (stop running) if there are no zombies

\_c\_\_ In the interface tab in NetLogo a *button* you are creating has the error message:

**Nothing named GO has been defined**

It most likely means that:

1. Turtles don’t have a variable named GO
2. You forgot to use a **turtles-own GO** command
3. You need to create a procedure called **GO**
4. You need to create a breed called **GO**

**5) [9 points]** Write the NetLogo commands to do the following (you don’t need to write a complete program):

a) Define a new breed of turtles called **dragon**.

b) Give each **dragon** a variable to keep track of how strong it is.

c) Create 10 agents of the breed **dragon**, all with the color green, the shape “dragon”, random coordinates, and facing up (towards the top of the screen).

breed [dragons dragon]

dragons-own [strength]

create-dragons 10 [

 set color green

 set shape “dragon”

 set heading 0

 setxy random-xcor random-ycor

]

**6) [9 points]** Write a NetLogo procedure called **fly-dragons** that does the following:

a) Makes all turtles of the breed **dragon** turn right 10 degrees, then

b) go forward 5, then

c) make any turtles with the breed **knight** on the same patch as a **dragon** die.

to fly-dragons

 ask-dragons [

 right 10 ; or ask dragons set heading heading + 10

 forward 5

 ask knights-here [die]

 ]

end

**6) [12 points]** Answer the questions below about the following block of code:

**ask patches [**

 **ifelse(pcolor = red)[**

 **ask turtles-here [**

**set heading heading + 90**

**forward 1**

 **]**

 **]**

 **[**

 **ask turtles-here [**

 **forward 0.1**

 **set energy (energy – 1)**

 **]**

 **]**

**]**

1. Under what conditions (i.e. when) will a turtle go forward 0.1?

If it’s not on a red patch

1. If a turtle is on a red patch what will it do?

Turn right 90 degrees and then go forward 1

1. When, if ever, will a turtle lose 1 energy?

If it’s not on a red patch