```
turtles-own[
  insured?
  checked?
  numberofedges
  payoff
]
globals[
  numberofinsued
  numberofnotinsured
  donewithinsured?
  donewithnotinsured?
  ]
to setup
  clear-all
  setup-turtles
  reset-ticks
  set numberofinsued 0
  set donewithinsured?
false
  set
donewithnotinsured?
false
  setup-patches
end

to setup-turtles
  set-default-shape
turtles "circle"

  crt num-nodes
  layout-circle turtles
max-pxcor - 20
  ask turtles [
    set payoff 0
    set insured? false
    set checked? false
    set color red

     if (random-float 100.0
<(prob-insured))[
      set color green
      set insured? true
      set numberofinsued
(numberofinsued + 1)
      ]
  ]
  ;ask turtles [ set label
who set label-color
black]

end

to setup-patches
ask patches [
  set pcolor white
  ]
end

to go
   if not
donewithinsured? [
    add-edge
  ]
  tick
end
```

```
to add-edge
 let node1 one-of turtles
with[not checked?]
 if node1 = nobody
 [
  display
  user-message "insured
clique finished"
  stop
  ]
 ask node1[
   let node2 one-of
turtles with [not link-
neighbor? node1 and
(self != node1) and not
checked?]

   ifelse node2 = nobody
  [
    set checked? true
    add-edge
   ]
  [
   let nolinkpayoff payoff
   ifelse insured?
   [
    ;node1 is insured
    ask node2
    [
     let nolinkpayoff2
payoff
      ifelse insured?
      [
        ;node2 and node1
insured
        let newpayoff1
(nolinkpayoff + (beta /
100) - (insurancelink /
100 ))
        let newpayoff2
(nolinkpayoff2 + (beta /
100) - (insurancelink /
100 ))
        if newpayoff1 >
nolinkpayoff and
newpayoff2 >
nolinkpayoff2
        [
          ;add link
          create-link-with
node1
          set payoff
newpayoff2
          ask node1[
            set payoff
newpayoff1

          ]
        ]
        ;done with adding
link
        ]
       [;begin else
        ;node2 not insured
        let newpayoff1
(nolinkpayoff + (beta /
```

```
100) - (risk / 100) -
(insurancelink / 100 ))
        let newpayoff2
(nolinkpayoff2 + (beta /
100))
        if newpayoff1 >
nolinkpayoff and
newpayoff2 >
nolinkpayoff2
        [
          ;add link
          create-link-with
node1
          set payoff
newpayoff2
          ask node1[
            set payoff
newpayoff1
          ]
        ]
        ;done with adding
link

        ];end else
      ];done with node2
      ]
    [
      ;node1 not insured
      ask node2
      [
        let nolinkpayoff2
payoff
       ifelse insured?
        [
         ;node2 insured
and node1 not insured
        let newpayoff1
(nolinkpayoff + (beta /
100))
        let newpayoff2
(nolinkpayoff2 + (beta /
100) - (risk / 100) -
(insurancelink / 100 ))
        if newpayoff1 >
nolinkpayoff and
newpayoff2 >
nolinkpayoff2
        [
          ;add link
          create-link-with
node1
          set payoff
newpayoff2
          ask node1[
            set payoff
newpayoff1

          ]
        ]
        ;done with adding
link
        ]
       [;begin else
        ;node2 and node1
not insured
```

```
        let newpayoff1
(nolinkpayoff + (beta /
100) - (risk / 100))
        let newpayoff2
(nolinkpayoff2 + (beta /
100) - (risk / 100))
        if newpayoff1 >
nolinkpayoff and
newpayoff2 >
nolinkpayoff2
        [
          ;add link
          create-link-with
node1
          set payoff
newpayoff2
          ask node1[
            set payoff
newpayoff1
          ]
        ]
        ;done with adding
link

        ];end else
      ];done with node2

     ]
    ;set color green
    ;add-edge
    ]
  ]
  layout
end

to add-edge-not-insured
 let node1 one-of turtles
with[not insured? and
not checked?]
 if node1 = nobody
 [
   ;display
   ;user-message "non-
insured clique finished"
   stop
   ]
  ask node1[
    let node2 one-of
turtles with [not
insured? and not link-
neighbor? node1 and
(self != node1) and not
checked?]
    ifelse node2 = nobody
    [
     display
     set
donewithnotinsured?
true
     set checked? true
     add-edge-not-insured
     ]
   [
   create-link-with node2
   add-edge-not-insured
    ]
```

```
  ]
  layout

end

to layout
  repeat 10 [
    layout-spring (turtles
with [any? link-
neighbors]) links 0.4 6 1
    display  ;; so we get
smooth animation
  ]
end
```