

```
turtles-own[
  insured?
  checked?
  numberofedges
  payoff
]
globals[
  numberofinsured
  numberofnotinsured
  donewithinsured?
  donewithnotinsured?
]
to setup
  clear-all
  setup-turtles
  reset-ticks
  set numberofinsured 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 numberofinsured (numberofinsured + 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