1.

```
#Presumably you have a var beach containing the path to the image
def sunset():
  addArcFilled(beach,215,165,60,50,-10,180,makeColor(255,195,0))
  writePictureTo(beach,"C:\\img1.png")
```

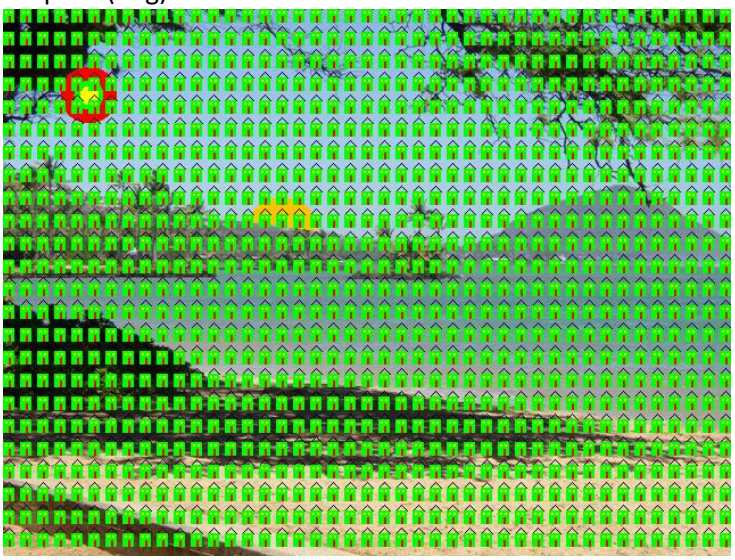
2.

```
def bullseye(img,x,y,w):
  addArcFilled(img,x,y,w,w,0,360,makeColor(255,0,0))
  addArcFilled(img,x+w/4,y+w/4,w/2+1,w/2+1,0,360,makeColor(0,255,0))
  addArcFilled(img,x+w/3+1,y+w/3+1,w/3+1,w/3+1,0,360,makeColor(255,255,0))
```

3.

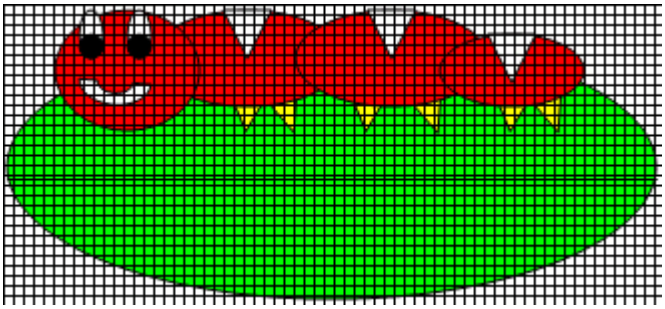
```
def addHouse(img,x1,y1):
  addLine(img, x1+5,y1-5,x1,y1)
  addLine(img, x1+5,y1-5,x1+10,y1)
  addRectFilled(img,x1,y1,10,12,green)
  addRectFilled(img,x1+2,y1+2,2,2,yellow)
  addRectFilled(img,x1+6,y1+2,2,2,yellow)
  addRectFilled(img,x1+5,y1+6,2,6,red)

def houseLoop(img):
  x=y=0
  while y<getHeight(img)-1:
    while x<getWidth(img)-1:
      addHouse(img,x,y)
      x=x+15
    x=0
    y=y+20
  explore(img)
```



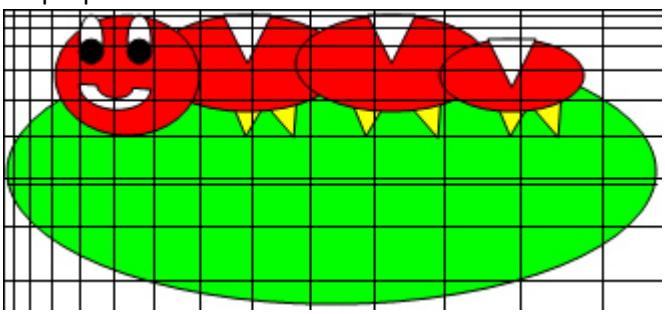
4.

```
def drawGrid(img,sp):
  x=y=0
  while(x<getWidth(img)-1):
    addLine(img,x,0,x,getHeight(img)-1)
    x=x+sp
  while(y<getHeight(img)-1):
    addLine(img,0,y,getWidth(img)-1,y)
    y=y+sp
```



5.

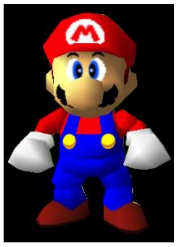
```
def drawGrid2(img):
  sp=5
  x=y=0
  while(x<getWidth(img)-1):
    addLine(img,x,0,x,getHeight(img)-1)
    x=x+sp
    sp=sp+3
  sp=0
  while(y<getHeight(img)-1):
    addLine(img,0,y,getWidth(img)-1,y)
    y=y+sp
    sp=sp+3
```



6.

```
def flip(img):
  imgOut = img
  for px in getPixels(img):
    if(getX(px) in range(0,getWidth(img)-1) and getY(px) in range(0,getHeight(img)-1)):
      setColor(getPixelAt(imgOut,getWidth(img)-getX(px)-1+0,getY(px)),getColor(px))
  return imgOut
```

 <- Before

 <- After

7.

```
def mirror20(img):
  imgOut = img
  for px in getPixels(img):
    if(getX(px) in range(0,20) and getY(px) in range(0,getHeight(img)-1)):
      setColor(getPixelAt(imgOut,20-getX(px)+20,getY(px)),getColor(px))
  return imgOut
```

8.

```
def scaleDown(img):
  xOld = yOld = xNew = yNew = 0
  newimg = makeEmptyPicture(getWidth(img)/2, getHeight(img)/2)
  while(true):
    px1 = getPixel(img, xOld,yOld)
    px2 = getPixel(img, xOld+1,yOld)
    px3 = getPixel(img, xOld,yOld+1)
    px4 = getPixel(img, xOld+1,yOld+1)
    r = (getRed(px1) + getRed(px2) + getRed(px3) + getRed(px4))/4
    g = (getGreen(px1) + getGreen(px2) + getGreen(px3) + getGreen(px4))/4
    b = (getBlue(px1) + getBlue(px2) + getBlue(px3) + getBlue(px4))/4
    setColor(getPixel(newimg, xNew, yNew), makeColor(r,g,b))
    xOld = xOld+2
    if(xOld >= getWidth(img)-1):
      xOld = 1
      yOld = yOld+2
    xNew = xNew+1
    if(xNew >= getWidth(newimg)-1):
      xNew=0
      yNew=yNew+1
    if(yOld >= getHeight(img) or yNew >=getHeight(newimg)):
      break
  return newimg
```

9.

```
def scaleUp(img):
  xOld = yOld = xNew = yNew = 0
  newimg = makeEmptyPicture(getWidth(img)*2, getHeight(img)*2)
  while(true):
    px0 = getPixel(img, xOld,yOld)
```

```
    px1 = getPixel(newimg, xNew,yNew)
    px2 = getPixel(newimg, xNew+1,yNew)
    px3 = getPixel(newimg, xNew,yNew+1)
    px4 = getPixel(newimg, xNew+1,yNew+1)
    r = getRed(px0)
    g = getGreen(px0)
    b = getBlue(px0)
    setColor(px1, makeColor(r,g,b))
    setColor(px2, makeColor(r,g,b))
    setColor(px3, makeColor(r,g,b))
    setColor(px4, makeColor(r,g,b))
    xNew = xNew+2
    if(xNew >= getWidth(newimg)-1):
      xNew = 1
      yNew = yNew+2
    xOld = xOld+1
    if(xOld >= getWidth(img)-1):
      xOld=0
      yOld=yOld+1
    if(yNew >= getHeight(newimg) or yOld >=getHeight(img)):
      break
  return newimg
```

Original Size: 

Scaled down: 

Scaled up: