Os exercícios “A” e “B” foram realizados com o MatLab, os exercícios 1,2 e 3 foram realizados com o Octave

EXERCISE “A”

```
%Load image blackrectangle.bmp
blackrectangle=imread('blackrectangle.bmp');
%display blackrectangle
image(blackrectangle);
%1 = Red
%2 = Blue
%3 = Blue
blackrectangleRed=blackrectangle([558:643],[622:703],1);
blackrectangleGreen=blackrectangle([558:643],[622:703],2);
blackrectangleBlue=blackrectangle([558:643],[622:703],3);
image(blackrectangleRed)
image(blackrectangleGreen)
image(blackrectangleBlue)
%blackrectangleBlue is the image
%convert to double
text=double(blackrectangleBlue);
%vector A rows 13:80 column 24
vectorA=text(13:80,24);
%vector B rows 13:80 column 45
vectorB=text(13:80,45);
%vector C rows 13:80 column 46
vectorC=text(13:80,46);
%Exponentiate vectorA to vectorB
vectorexp=vectorA.^vectorB;
%Multply
vectorMult=vectorexp.*vectorB;
%Add vector C in ans
vectorSum=vectorMult+vectorC;
%Add 32 in ans
vector32=vectorSum+32;
%Char A
char(vector32)
%Char B = Transpose char A
char(vector32')
```

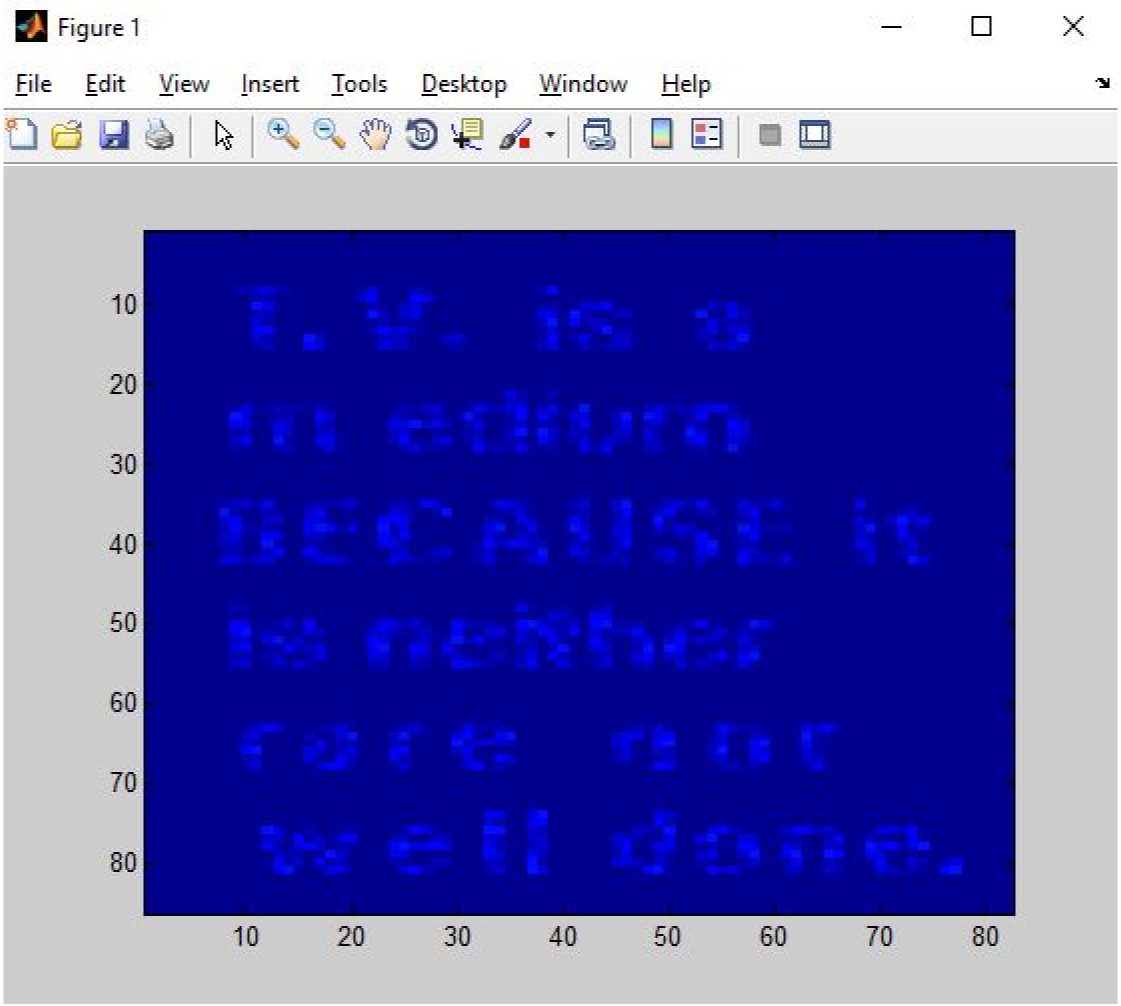
Figure 1
File
Edit
View
Insert
Tools
Desktop
Window
Help
T.V. is a
m edium
BECAUSE it
is neither
rare nor
well done.
10
20
30
40
50
60
70
80
10
20
30
40
50
60
70
80

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homework

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```
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ans =

But      your      homework      is         well        done

>>
```
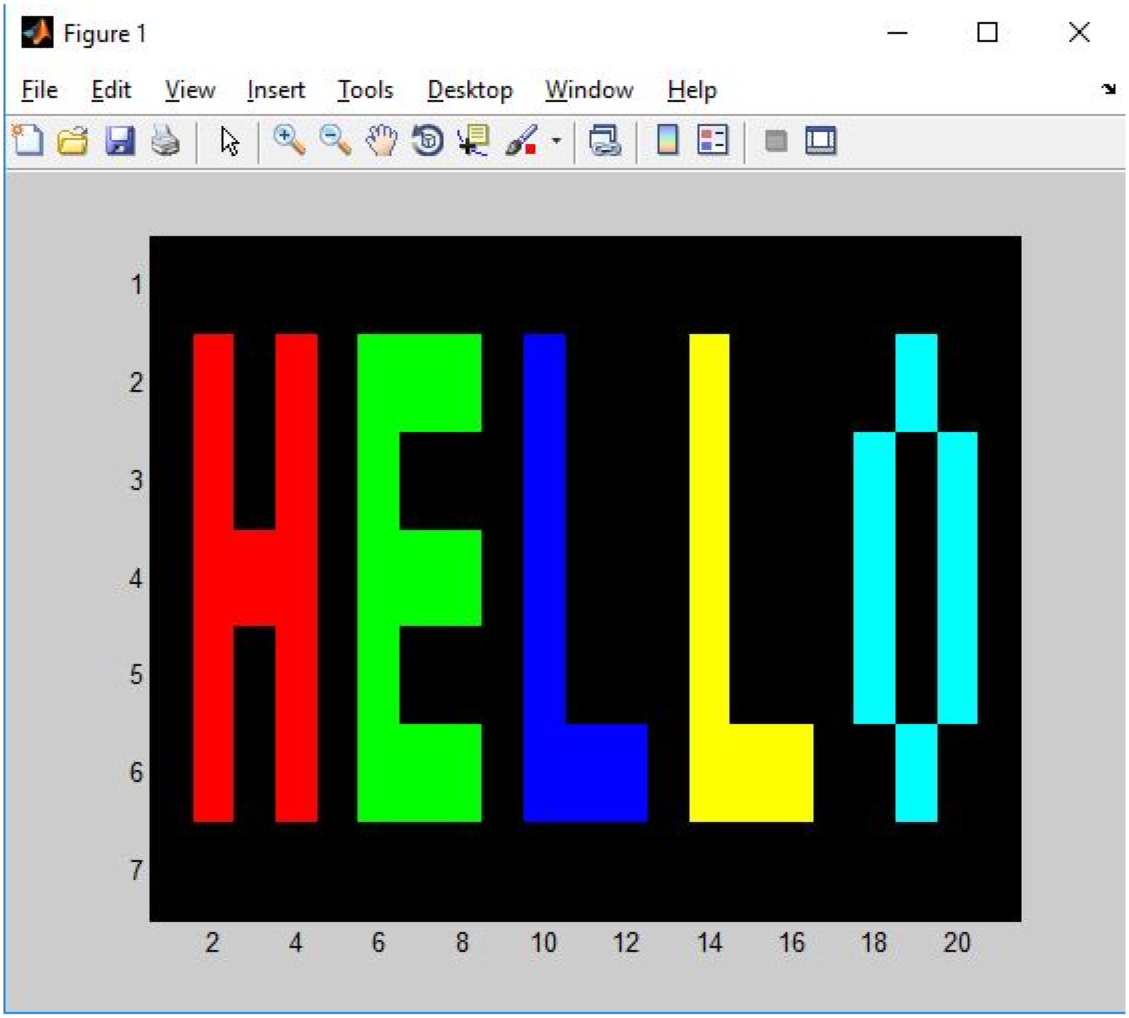

EXERCISE “B”

```
%Red Layer
r=rand(7,21)*0;
%Green Layer
g =r;
%Blue Layer
b =r;

%Letter H
r(2:6,2) = [255,255,255,255,255];
r(2:6,4) = [255,255,255,255,255];
r(4,3) = 255;
%Letter E
g(2,6:8)=[255,255,255];
g(4,6:8)=[255,255,255];
g(6,6:8)=[255,255,255];
g(3,6)=255;
g(5,6)=255;
%Letter LB
b(2:6,10)=[255,255,255,255,255];
b(6,11:12)=[255,255];
%Letter LY
r(2:6,14)=[255,255,255,255,255];
r(6,15:16)=[255,255];
g(2:6,14)=[255,255,255,255,255];
g(6,15:16)=[255,255];
%Letter O
```

```
g(3:5,18)=[255,255,255];
g(3:5,20)=[255,255,255];
g(2,19)=255;
g(6,19)=255;
b(3:5,18)=[255,255,255];
b(3:5,20)=[255,255,255];
b(2,19)=255;
b(6,19)=255;

%Setting Matrix red values
hello(1:7,1:21,1)=r;
%Setting Matrix green values
hello(1:7,1:21,2)=g;
%Setting Matrix blue values
hello(1:7,1:21,3)=b;

%Showing Matrix
hello

%Turning matrix as HELLO
hello = uint8(hello)

%Showing Image ("HELLO")
image(hello)
```

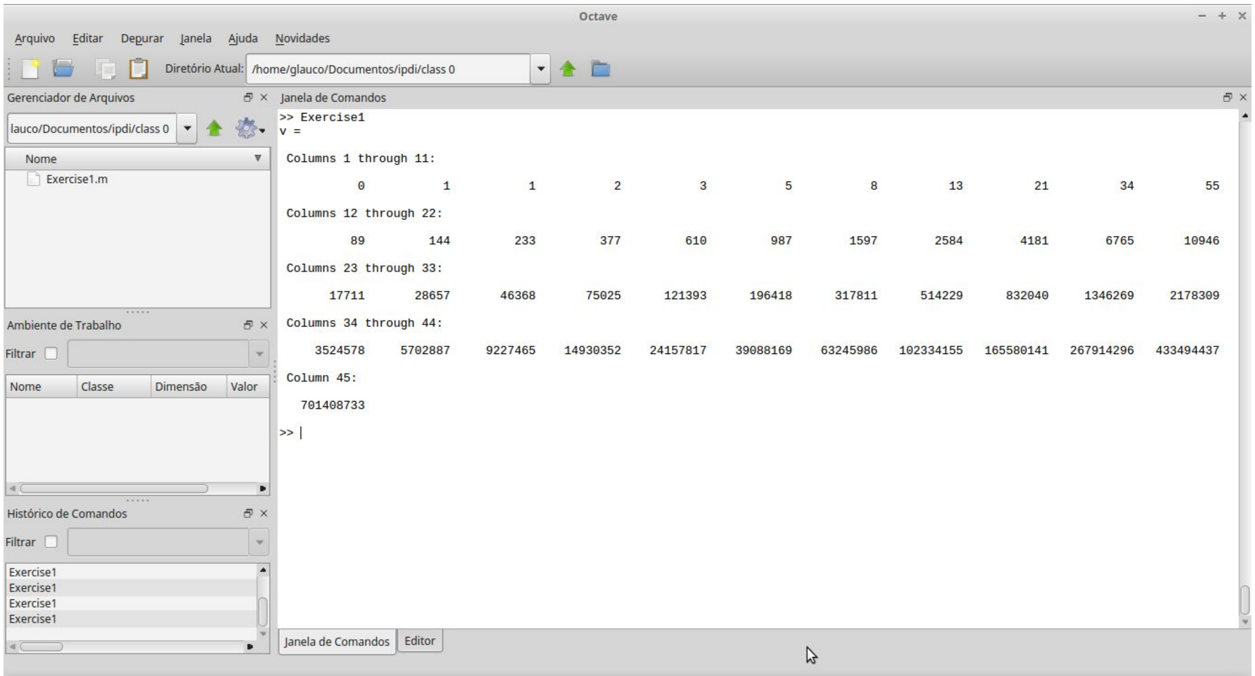


```
hello(:,:,1) =

    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
    0  255    0  255    0    0    0    0    0    0    0    0    0  255    0    0    0    0    0    0    0
    0  255    0  255    0    0    0    0    0    0    0    0    0  255    0    0    0    0    0    0    0
    0  255  255  255    0    0    0    0    0    0    0    0    0  255    0    0    0    0    0    0    0
    0  255    0  255    0    0    0    0    0    0    0    0    0  255    0    0    0    0    0    0    0
    0  255    0  255    0    0    0    0    0    0    0    0    0  255  255  255    0    0    0    0    0
    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0


hello(:,:,2) =

    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
    0    0    0    0    0  255  255  255    0    0    0    0    0  255    0    0    0    0  255    0    0
    0    0    0    0    0  255    0    0    0    0    0    0    0  255    0    0    0  255    0  255    0
    0    0    0    0    0  255  255  255    0    0    0    0    0  255    0    0    0  255    0  255    0
    0    0    0    0    0  255    0    0    0    0    0    0    0  255    0    0    0  255    0  255    0
    0    0    0    0    0  255  255  255    0    0    0    0    0  255  255  255    0    0  255    0    0
    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0


hello(:,:,3) =

    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
    0    0    0    0    0    0    0    0    0  255    0    0    0    0    0    0    0    0  255    0    0
    0    0    0    0    0    0    0    0    0  255    0    0    0    0    0    0    0  255    0  255    0
    0    0    0    0    0    0    0    0    0  255    0    0    0    0    0    0    0  255    0  255    0
    0    0    0    0    0    0    0    0    0  255    0    0    0    0    0    0    0  255    0  255    0
    0    0    0    0    0    0    0    0    0  255  255  255    0    0    0    0    0    0  255    0    0
    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0


hello(:,:,1) =

    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
    0  255    0  255    0    0    0    0    0    0    0    0    0  255    0    0    0    0    0    0    0
    0  255    0  255    0    0    0    0    0    0    0    0    0  255    0    0    0    0    0    0    0
    0  255  255  255    0    0    0    0    0    0    0    0    0  255    0    0    0    0    0    0    0
    0  255    0  255    0    0    0    0    0    0    0    0    0  255    0    0    0    0    0    0    0
    0  255    0  255    0    0    0    0    0    0    0    0    0  255  255  255    0    0    0    0    0
    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0


hello(:,:,2) =

    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
    0    0    0    0    0  255  255  255    0    0    0    0    0  255    0    0    0    0  255    0    0
    0    0    0    0    0  255    0    0    0    0    0    0    0  255    0    0    0  255    0  255    0
    0    0    0    0    0  255  255  255    0    0    0    0    0  255    0    0    0  255    0  255    0
    0    0    0    0    0  255    0    0    0    0    0    0    0  255    0    0    0  255    0  255    0
    0    0    0    0    0  255  255  255    0    0    0    0    0  255  255  255    0    0  255    0    0
    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0


hello(:,:,3) =

    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
    0    0    0    0    0    0    0    0    0  255    0    0    0    0    0    0    0    0  255    0    0
    0    0    0    0    0    0    0    0    0  255    0    0    0    0    0    0    0  255    0  255    0
    0    0    0    0    0    0    0    0    0  255    0    0    0    0    0    0    0  255    0  255    0
```

```
  0   0   0   0   0   0   0   0   0 255   0   0   0   0   0   0   0 255   0 255   0
  0   0   0   0   0   0   0   0   0 255 255 255   0   0   0   0   0   0 255   0   0
  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
```

Exercise 1 - Single Loop: Fibonacci Numbers

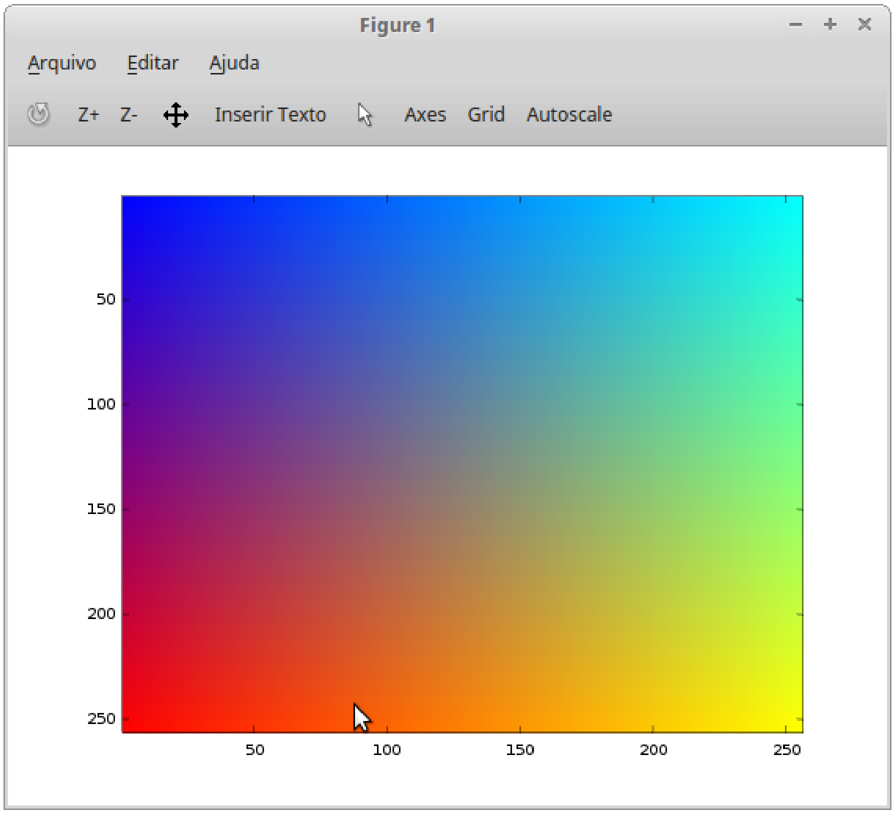
```
function Exercise1()
v = rand(1,45)*0;
v(1,2) = [1];
i=3;
while(i<=45)
  v(1,i) = v(1,i-2) + v(1,i-1);
  i=i+1;
end

v
```



```
>> Exercise1
v =

 Columns 1 through 11:

           0           1           1           2           3           5           8          13          21          34          55

 Columns 12 through 22:

          89         144         233         377         610         987        1597        2584        4181        6765       10946

 Columns 23 through 33:

       17711       28657       46368       75025      121393      196418      317811      514229      832040     1346269     2178309

 Columns 34 through 44:

     3524578     5702887     9227465    14930352    24157817    39088169    63245986   102334155   165580141   267914296   433494437

 Column 45:

   701408733

>> |
```

Exercise 2: Nested Loops: 2D gradient

```
function Exercise2()
%matriz gradiente vazia
%grad=rand(256,256)*0;
grad=[];                    %Slide 84
%Enunciado
% AZUL    --- CYAN
% MAGENTA ---  ????
% RED     --- YELLOW
% 0~255 intensidade
% 1~256 dimensao da matriz
for i=1:256                 %Slide 88
  for j=1:256               %Slide 88
    grad(i,j,1)=i;          %vermelho aparece primeiro nas linhas depois nas colunas
    grad(i,j,2)=j;          %verde aparece primeiro nas colunas depois linhas
    grad(i,j,3)=255 - (i-1);  %Slide 87 decrementando o valor do azul, logo começa com o azul
  end
end
image(uint8(grad));

end
```



Exercise 3 - Nested Loops: Snake (not a real one)

NÃO USANDO IF-ELSE

```
function Exercise3()
%Criando a Matriz 8x8
n = rand(8,8)*0;
%Valor escalar
%Cresce da esquerda para a direita
s = 0;
%Línhas impares
for i=1:i+2:8
    for j=1:8
        n(i,j) = s;
        s = s + 1;
    end
    s = s + 8;
end
%pre visualizaçao
n
%Agora cresce da direita para a esquerda
s = 8;
for i=2:i+2:8
    for j=8:-1:1
        n(i,j) = s;
        s = s + 1;
    end
    s = s + 8;
end
n
%mostrando a imagem
%image(uint8(n));
%usando a funçao dada
image(n), colormap(jet(64));
end
```

USANDO IF-ELSE

```
function Exercise3()
%no exercicio colocou image(n) logo chamei a matriz de n
n = [ ];
s = 0;
%ideia eh criar linha com 8 valores
%trabalhar de forma mutua pra evitar trabalho
```

```
%linha impar e linha par
%na internet todo mundo usa mod ou rem pra verificar se eh impar ou par

for linha=1:8
    if (rem(linha,2) == 1)            %como x e y s~ao positivos posso usar rem no lugar de mod,
mas o melhor eh usar mod
        %impar
        %se for impar eu incremento valor da esquerda pra direita (numero min=1 : numero
max=8)
        coluna = 1:8;
    else
        %par
        %se for par eu incremento os valores da direita pra esquerda (numero maximo=8: -1
(para decrementar) : numero limite=1)
        coluna = 8:-1:1;
        %usa-se x:y:z quando se quer que o x=posição inicial; y o numero a somar a posição x;
z = posição final
    end
    for j=coluna
        n(linha,j) = s;
        %como a matriz sempre incrementa  de 1 em 1, logo, s++
        s = s + 1;
    end
end
n
image(n), colormap(jet(64)); %64=linha*coluna=8*8
end
```

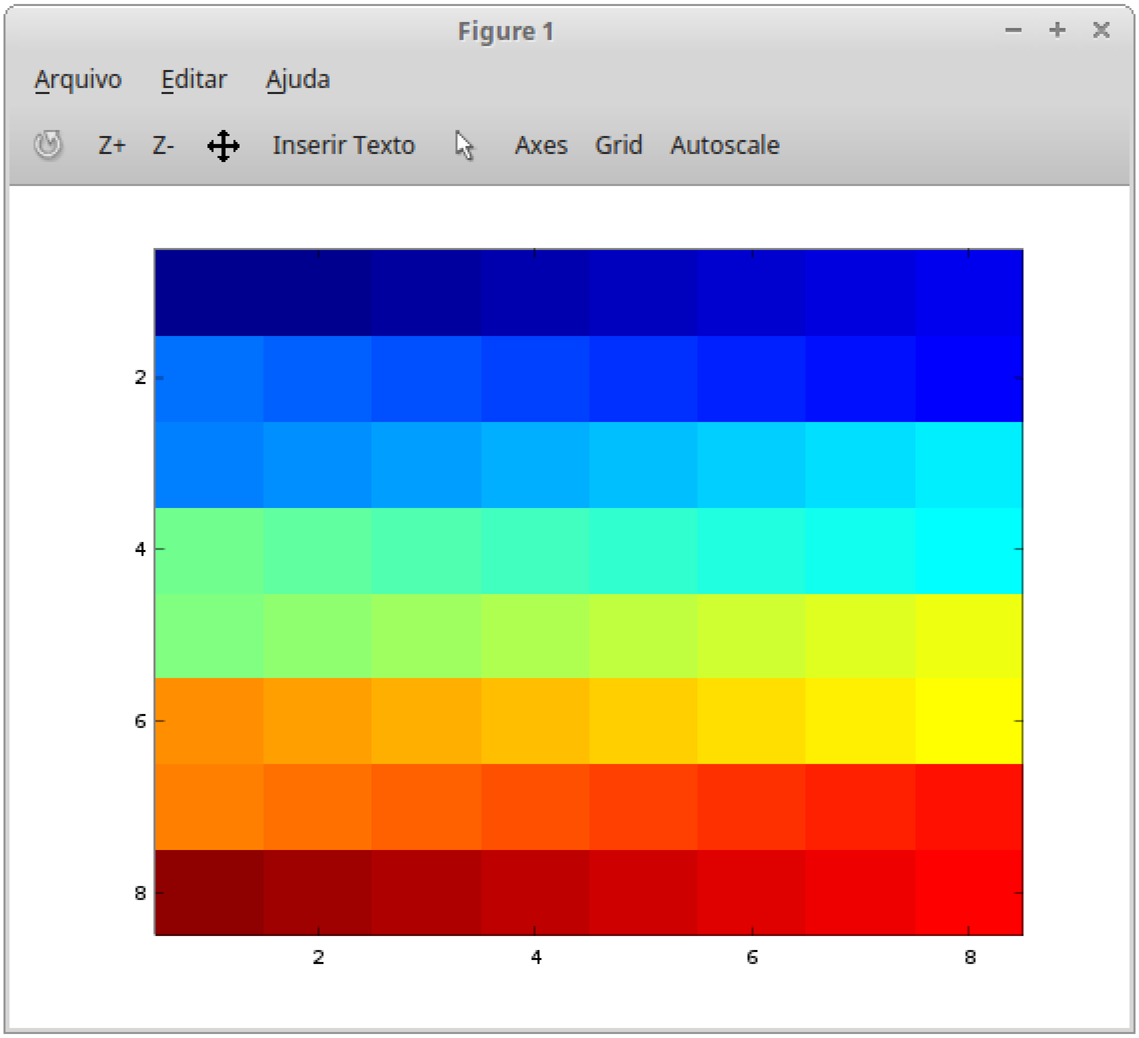


Figure 1
Arquivo
Editar
Ajuda
Z+
Z-
Inserir Texto
Axes
Grid
Autoscale
2
4
6
8
2
4
6
8