```
(* Convert a colour RGB image to grayscale *)

(* Since RGB images are composed of red green and blue channels,
averaging these pixel values will give us a
 single pixel value which can be used as grayscale *)



(* TEST – create an average image of a 1D image  *)


(* define the image as a 1D array of pixel values between 0 and 255 *)
```

In[406]:=
```
colours = Table[
  {RandomReal[1], RandomReal[1], RandomReal[1]}, {10}
 ]
```

Out[406]=
```
{{0.946817, 0.194567, 0.493144}, {0.656066, 0.0619158, 0.505979},
 {0.60832, 0.020667, 0.631014}, {0.54909, 0.00818998, 0.141107},
 {0.0935201, 0.64175, 0.533029}, {0.321566, 0.566463, 0.481427},
 {0.83097, 0.302915, 0.554459}, {0.425679, 0.157365, 0.0859321},
 {0.154577, 0.433958, 0.471096}, {0.850965, 0.602461, 0.0938325}}
```

```
(* define a delayed function which
 calculates the average RGB values per pixel *)
```

In[345]:=
```
average[list_] := Total[list / 3];
```

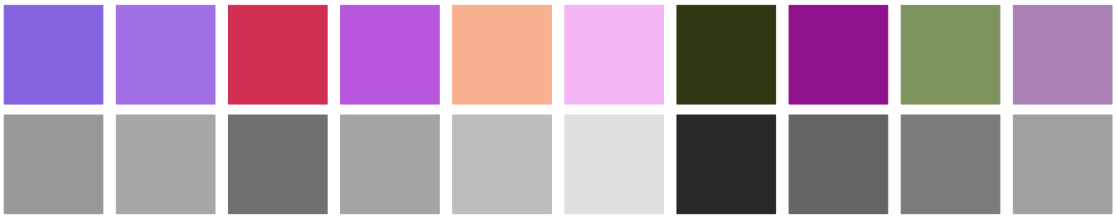
```
(* average teh pixel values in the colour vector *)
```

In[355]:=
```
averaged = Table[
  average[colours[[n]]], {n, 1, Length[colours]}
 ]
```

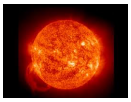
Out[355]=
```
{0.596026, 0.655416, 0.439814, 0.64232,
 0.741016, 0.87444, 0.15657, 0.392406, 0.481529, 0.62921}
```

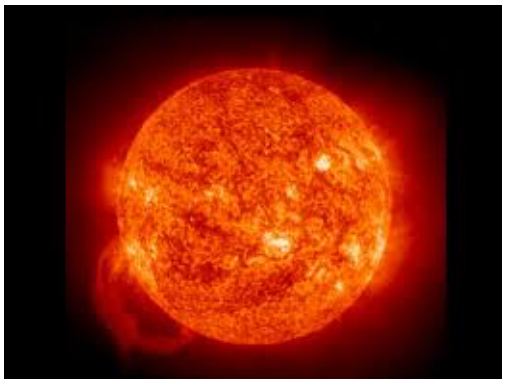
```
(* Compare original with averaged values  *)

GraphicsGrid[{
  Table[
   Graphics[{RGBColor[colours[[n]]], Rectangle[]}]
   , {n, 1, Length[colours]}
  ],
  Table[
   Graphics[{GrayLevel[averaged[[n]]], Rectangle[]}]
   , {n, 1, Length[colours]}
  ]
 }]
```

Out[369]=



```
(* sample image *)
```

In[430]:=
```
sun =
```


Out[430]=


In[435]:=
```
ImageDimensions[sun]
```

Out[435]=
```
{259, 194}
```

```
(* Average each row in the image *)
```

In[445]:=
```
averaged = Table[
   Table[
    average[ImageData[sun][[row, column]]], {column, 1, 259}
   ], {row, 1, 194}
  ];
```

In[404]:=
```
Image[averaged]
```

Out[404]=