Array Basics

Importing libraries

```
begin
    import Pkg
end
```

```
begin
    Pkg.add(["Images", "ImageMagick"])
    using Images
end
```

Array Basics

```
v =   Int64[1,  2,  3,  4]
```

```
# vector
v = [1, 2, 3, 4]
```

```
(4)
```

```
size(v)
```

```
w = 2×3 Array{Int64,2}:
    1   2   3
    4   5   6
```

```
# array
w = [1 2 3
     4 5 6]
```

```
(2,  3)
```

```
size(w)
```

```
1
```

```
# indexing from 1
w[1, 1]
```

```
Int64[1,  4]
```

```
w[:, 1]
```

```
a_random = 3×4 Array{Int64,2}:
```

```
8   6   8   7
9   6   5   1
8   9   7   6
```

- # random numbers in an arary
- a_random = rand(1:9, 3, 4)

---

a1_random_emo = 3×4 Array{String,2}:
```
"🐼"   "💣"   "🔭"   "🏆"
""    "🍲"   "🐼"   ""
""    "🏆"   ""    ""
```

- a1_random_emo = string.(rand("💣💥👑🐼🍕🏆🎯🔔🍞🔭", 3, 4))

---

a2_random_emo =

🐼 🎯 🎯 💥
🏆 🏆 🍕 🏆
💥 🍕 🏆 🎯

- a2_random_emo = string.(rand("💥👑🐼🍕🏆🎯", 3, 4)) |> pretty

---

pretty (generic function with 1 method)

```julia
function pretty(M::Matrix{T} where T<:String)
    nax_length = maximum(length.(M))
    dv = "<div style='display:flex;flex-directon:row'>"
    HTML(dv*join([join("<div style='idth:40px; text-align:center'>".*M[i, :].*"
</div>", "  ") for i in 1:size(M, 1)]
        , "</div>$dv")*"</div>")
end
```
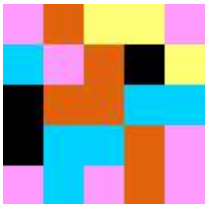
---

colors_5 =   RGB{Normed{UInt8,8}}[■, ■, ■, ■, ■,

- # colors OP
- colors_5 = distinguishable_colors(5)

---

a3_random_colors =

a3_random_colors = rand(colors_5, 5, 5)

---

colors_10 =   RGB{Normed{UInt8,8}}[■, ■, ■, ■,

- colors_10 = distinguishable_colors(10)

`a4_random_colors =`
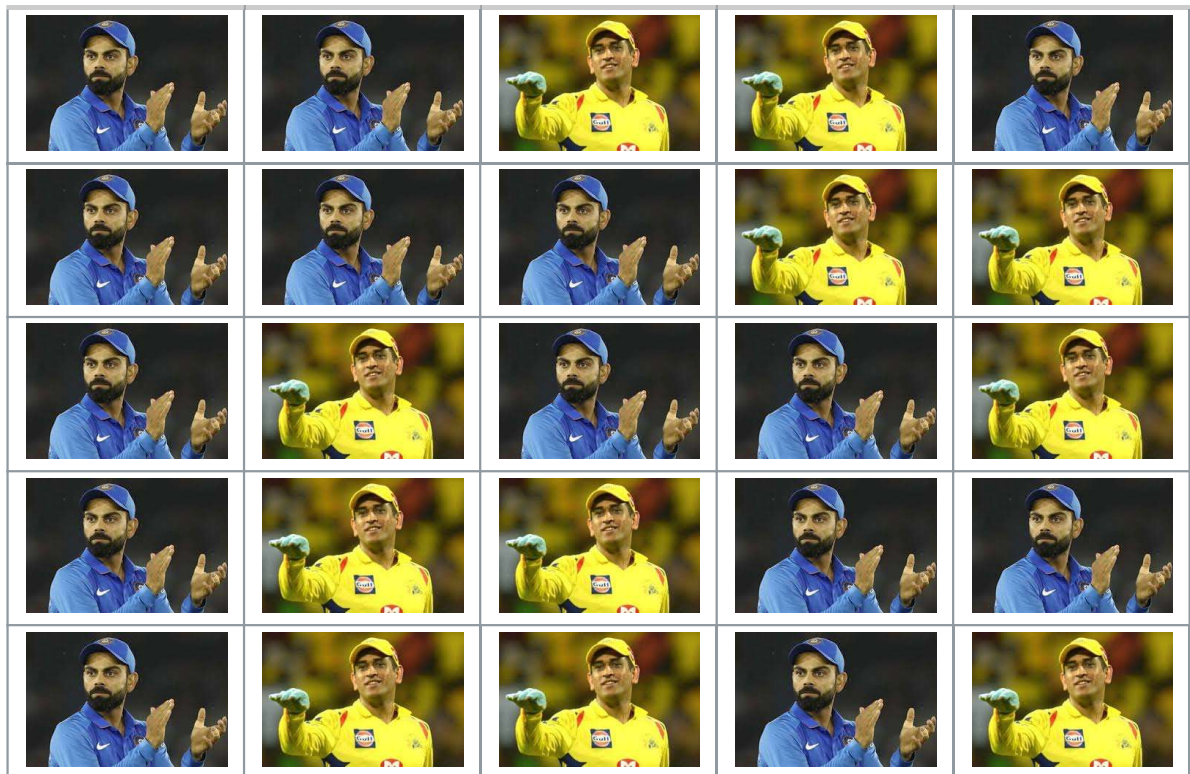

- `a4_random_colors = rand(colors_10, 10, 10)`


```
# images
begin
    dhoni = load(download("https://encrypted-tbn0.gstatic.com/images?
q=tbn%3AANd9GcT6sCuu5eg-c0WtvL0nwOoghanJOMypdfLUoA&usqp=CAU"))
    kohli = load(download("https://encrypted-tbn0.gstatic.com/images?
q=tbn%3AANd9GcRWWGZgPVdzWZppJfzg8rqSWRd-Gfjz1eD_Lw&usqp=CAU"))
end
```

`a5_mahirat =`

- `a5_mahirat = rand([dhoni, kohli], 5, 5)`

```
begin
    temp_mahirat = fill(dhoni, 3, 3)
    temp_mahirat[1, 1] = kohli
    temp_mahirat[2, 2] = kohli
    temp_mahirat[3, 3,] = kohli
    temp_mahirat
end
```
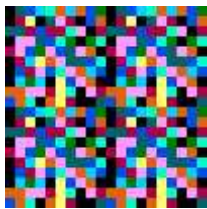


```
# horizontal concat
[temp_mahirat temp_mahirat]
```

- *# vertical concat*
- [**temp_mahirat**; **temp_mahirat**]

- *# khichdi*
- [**a4_random_colors a4_random_colors**; **a4_random_colors a4_random_colors**]

Comprehensions

```
multi_table = 4×4 Array{Int64,2}:
               1   2    3     4
               2   4    6     8
               3   6    9    12
               4   8   12    16
```

- **multi_table** = [**i*j** for i = 1:4, j = 1:4]

```
4×4 Array{Int64,2}:
  1    4     9    16
  4   16    36    64
  9   36    81   144
 16   64   144   256
```

- *# element wise*
- **multi_table.^2**

```
4×4 Array{Int64,2}:
  30    60    90   120
  60   120   180   240
  90   180   270   360
 120   240   360   480
```

- *# matrix multiplication*
- **multi_table ^ 2**