

# ARRAY

FONDAMENTI DI INFORMATICA

PREVIOUSLY ON  
"FONDAMENTI DI  
INFORMATICA"

- Vero e falso
- Condizioni (if)
- Cicli

# ESERCIZIO

Calcoliamo la media degli esami sapendo che ne faremo 5

FACILE!

# MEDIA ESAMI

```
int voto0 = 30;
int voto1 = 27;
int voto2 = 18;
int voto3 = 30;
int voto4 = 21;
double media = (voto0 + voto1 + voto2 + voto3 + voto4)/5.0;
System.out.println(media);
```

# ESERCIZIO

Calcoliamo la media degli esami sapendo che  
ne faremo **10**

UHMMM...

```
int voto0 = 30;  
int voto1 = 27;  
int voto2 = 18;  
int voto3 = 30;  
int voto4 = 21;  
int voto5 = 30;  
int voto6 = 27;  
int voto7 = 18;  
int voto8 = 30;  
int voto9 = 21;  
...
```

# ESERCIZIO

Calcoliamo la media degli esami sapendo che  
ne faremo **20**

# ESERCIZIO

Calcoliamo la media degli esami sapendo che  
ne faremo **100!!!**

**ARE YOU SERIOUS**



**RIGHT NOW!**

# ESERCIZIO

Calcoliamo la media degli esami sapendo che ne faremo 3 e mostriamo sullo schermo il valore di tutti gli esami

# MEDIA ESAMI

```
int voto0 = 30;
int voto1 = 27;
int voto2 = 18;
double media = (voto0 + voto1 + voto2) / 3.0;
System.out.println(media);
System.out.println("Voto 0:" + voto0);
System.out.println("Voto 1:" + voto1);
System.out.println("Voto 2:" + voto2);
```

# ESERCIZIO

Ripetiamo con 5 esami.

# ESERCIZIO

Ripetiamo con 5 esami.

Poi con 10.

# ESERCIZIO

Ripetiamo con 5 esami.

Poi con 10.

Anche con 20!

# ESERCIZIO

Ripetiamo con 5 esami.

Poi con 10.

Anche con 20!

E con 100, perchè no?

# SOLUZIONE: ARRAY

Un array è un oggetto che contiene un numero **predeterminato** di variabili dello stesso **tipo**

# DICHIARAZIONE

```
Tipo[ ] nomeArray = new Tipo[dimensioneArray];
```

# ARRAY

Una volta definita la **dimensione** dell'array non può più cambiare

La **dimensione** dell'array può essere indicata anche con una variabile

# DICHIARAZIONE

```
int[ ] voti = new int[10];
```

# DICHIARAZIONE

```
int dimensione = 10;  
int[ ] voti = new int[dimensione];
```

# ACCESSO

Per accedere all'elemento in posizione "indice" si usa il comando:

```
nomeArray[indice];
```

Il primo elemento ha indice pari a 0, l'ultimo pari a `dimensioneArray-1`

# ACCESSO

- assegnare un valore: `nomeArray[0] = 5` assegna il valore 5 al primo elemento dell'array
- leggere un valore: `int valore = nomeArray[0]` copia nella variabile `valore` il contenuto del primo elemento dell'array

# ARRAY

0	1	0	0	0	0	0	1
---	---	---	---	---	---	---	---

0	1	1	0	0	0	0	1
---	---	---	---	---	---	---	---

1	1	0	0	0	0	1	0
---	---	---	---	---	---	---	---

1	1	1	0	0	0	1	0
---	---	---	---	---	---	---	---

1	1	0	0	0	0	1	1
---	---	---	---	---	---	---	---

1	1	1	0	0	0	1	1
---	---	---	---	---	---	---	---

0	1	0	0	0	1	0	0
---	---	---	---	---	---	---	---

0	1	1	0	0	1	0	0
---	---	---	---	---	---	---	---



`byte[] x = new byte[3]`

# ARRAY

0	1	0	0	0	0	0	1
---	---	---	---	---	---	---	---

0	1	1	0	0	0	0	1
---	---	---	---	---	---	---	---

1	1	0	0	0	0	1	0
---	---	---	---	---	---	---	---

1	1	1	0	0	0	1	0
---	---	---	---	---	---	---	---

1	1	0	0	0	0	1	1
---	---	---	---	---	---	---	---

1	1	1	0	0	0	1	1
---	---	---	---	---	---	---	---

0	1	0	0	0	1	0	0
---	---	---	---	---	---	---	---

0	1	1	0	0	1	0	0
---	---	---	---	---	---	---	---



x[0];

x[1];

x[2];

# INIZIALIZZAZIONE

```
int[] nomeArray = new int[5];
```

```
nomeArray[0] = 100;
```

```
nomeArray[1] = 200;
```

```
nomeArray[2] = 300;
```

```
nomeArray[3] = 400;
```

```
nomeArray[4] = 500;
```

# INIZIALIZZAZIONE

```
int[] nomeArray = {100, 200, 300, 400, 500};
```

# LUNGHEZZA DI UN ARRAY

Per sapere la lunghezza dell'array:

```
nomeArray.length;
```

È una variabile, non un metodo!

**Attenzione:** è una variabile speciale! Non può essere modificata.

# ARRAY E CICLI

```
int[] array = {100, 200, 300, 400, 500};  
  
for (int i = 0; i < array.length; i++) {  
    System.out.println("Valore "+ i + ":" + array[i]);  
}
```

# ESERCIZIO

Calcoliamo la media degli esami sapendo che ne faremo 10 e mostriamo sullo schermo il valore di tutti gli esami

# UNA SOLUZIONE

```
int voti[] = {21, 20, 30, 18, 25, 21, 20, 30,
18, 25};
double media = 0.0;
for(int i=0; i<voti.length; i++){
    media += (double)voti[i] / voti.length;
    System.out.println("Voto "+voti[i]);
}
System.out.println("Media voti: "+media);
```

# CICLI ABBREVIATI

```
for (int valore : nomeArray) {  
    System.out.println("Valore: " + valore);  
}
```

# ARRAY MULTIDIMENSIONALI

Possono essere anche multidimensionali

```
int[ ][ ] array = new int[righe][colonne]
```

Un array bidimensionale è un array di array

# TABELLA PITAGORICA

```
int[][] pitagora = new int[10][10];
for (int riga = 0; riga < pitagora.length; riga++) {
    int[] valoriRiga = pitagora[riga];
    for(int col = 0; col < valoriRiga.length; col++){
        pitagora[riga][col] = (riga+1)*(col+1);
    }
}
```

# ARRAY

0	1	0	0	0	0	0	1
---	---	---	---	---	---	---	---

0	1	1	0	0	0	0	1
---	---	---	---	---	---	---	---

1	1	0	0	0	0	1	0
---	---	---	---	---	---	---	---

1	1	1	0	0	0	1	0
---	---	---	---	---	---	---	---

1	1	0	0	0	0	1	1
---	---	---	---	---	---	---	---

1	1	1	0	0	0	1	1
---	---	---	---	---	---	---	---

0	1	0	0	0	1	0	0
---	---	---	---	---	---	---	---

0	1	1	0	0	1	0	0
---	---	---	---	---	---	---	---



```
byte[][] x = new byte[2][3]
```

# ARRAY

0	1	0	0	0	0	0	1
---	---	---	---	---	---	---	---

0	1	1	0	0	0	0	1
---	---	---	---	---	---	---	---

1	1	0	0	0	0	1	0
---	---	---	---	---	---	---	---

1	1	1	0	0	0	1	0
---	---	---	---	---	---	---	---

1	1	0	0	0	0	1	1
---	---	---	---	---	---	---	---

1	1	1	0	0	0	1	1
---	---	---	---	---	---	---	---

0	1	0	0	0	1	0	0
---	---	---	---	---	---	---	---

0	1	1	0	0	1	0	0
---	---	---	---	---	---	---	---

} x[0];

} x[1];

# ARRAY

0	1	0	0	0	0	0	1
---	---	---	---	---	---	---	---

0	1	1	0	0	0	0	1
---	---	---	---	---	---	---	---

1	1	0	0	0	0	1	0
---	---	---	---	---	---	---	---

1	1	1	0	0	0	1	0
---	---	---	---	---	---	---	---

1	1	0	0	0	0	1	1
---	---	---	---	---	---	---	---

1	1	1	0	0	0	1	1
---	---	---	---	---	---	---	---

0	1	0	0	0	1	0	0
---	---	---	---	---	---	---	---

0	1	1	0	0	1	0	0
---	---	---	---	---	---	---	---



x[0][0];

x[0][1];

x[0][2];

x[1][0];

x[1][1];

x[1][2];