Using the Array Templates

Sheet 5.3

UNIT 5: ARRAYS

Lesson	Video	A (Level 1)
5.1 Memory Diagrams	Basic Arr	A1 Commc
5.2 Printing	https	A2 Apartm
5.3 Array Templates - String template - char template - int template - double template	Basic Array Algorithms: https://youtu.be/R5KQGmmFs1o Using Array Templates: https://youtu.be/1m0qYiq5DE8	A3 Pumpki
5.4 2D Arrays	https://youtu.be/WZzO9-rxFhw	
5.5 Grid Arrays	https://youtu.be/cGjfwbw_vrQ	A4 Scrubb
5.6 Movement	https://youtu.be/kV8NtAu_Ep0	A5 Winnie A6 Fishes

The array templates are found here.

Circle the template you'd use for this array.

```
String sub[] = {"Math", "English", "Physics", "Art"};
```

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5.1 Memory Diagrams	Basic Arrays: https://youtu.be/s4TxqTIok2A	A1 Commc
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5.6 Movement	https://youtu.be/kV8NtAu_Ep0	A5 Winnie A6 Fishes

You want to print this array all on one line. Circle the code you need and adapt it.

```
String sub[] = {"Math", "English", "Physics", "Art"};
```

1
```
//Print horizontally
for (int i = 0 ; i < a.length ; i++)
  System.out.print (a [i] + " ");
System.out.println ();
```

2
```
//Print horizontally, greater than a value
for (int i = 0 ; i < a.length ; i++)
{ if (a [i].compareTo ("melon") < 0)
    System.out.print (a [i] + " ");
}
System.out.println ();
```

3
```
//Print vertically
for (int i = 0 ; i < a.length ; i++)
  System.out.println (a [i] + " ");
System.out.println ();
```

4
```
//Maximum, Largest value
String max = a [0];
for (int i = 0 ; i < a.length ; i++)
{
   if (a [i].compareTo (max) > 0)
      max = a [i];
}
System.out.println ("The largest value is: " + max);
```

5
```
//Minimum, Smallest value
String min = a [0];
for (int i = 0 ; i < a.length ; i++)
{
   if (a [i].compareTo (min) < 0)
      min = a [i];
}
System.out.println ("The smallest value is: " + min);
}
```

You want to find the biggest value in this array. Circle the code you need and adapt it.

```
String sub[] = {"Math", "English", "Physics", "Art"};
```

1
```
//Print horizontally
for (int i = 0 ; i < a.length ; i++)
  System.out.print (a [i] + " ");
System.out.println ();
```

2
```
//Print horizontally, greater than a value
for (int i = 0 ; i < a.length ; i++)
{ if (a [i].compareTo ("melon") < 0)
    System.out.print (a [i] + " ");
}
System.out.println ();
```

3
```
//Print vertically
for (int i = 0 ; i < a.length ; i++)
  System.out.println (a [i] + " ");
System.out.println ();
```

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```
//Maximum, Largest value
String max = a [0];
for (int i = 0 ; i < a.length ; i++)
{
   if (a [i].compareTo (max) > 0)
      max = a [i];
}
System.out.println ("The largest value is: " + max);
```

5
```
//Minimum, Smallest value
String min = a [0];
for (int i = 0 ; i < a.length ; i++)
{
   if (a [i].compareTo (min) < 0)
      min = a [i];
}
System.out.println ("The smallest value is: " + min);
}
```

Circle the template you'd use for this array.

```
int num[] = {5, 7, 3, 11, 76, 2, 90};
```

UNIT 5: ARRAYS

Lesson	Video	A (Level 1)
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5.6 Movement	https://youtu.be/kV8NtAu_Ep0	A5 Winnie A6 Fishes

You want to print out all of the numbers less than 18. Circle the code you need and adapt it.

```
int num[] = {5, 7, 3, 11, 76, 2, 90};
```

1
```
//Print horizontally
for (int i = 0 ; i < a.length ; i++)
    System.out.print (a [i] + " ");
System.out.println ();
```

2
```
//Print horizontally, greater than value
for (int i = 0 ; i < a.length ; i++)
{
    if (a [i] >= 5)
      System.out.print (a [i] + " ");
}
System.out.println ();
```

3
```
//Print vertically
for (int i = 0 ; i < a.length ; i++)
    System.out.println (a [i] + " ");
System.out.println ();
```

4
```
//Sum or Total
int sum = 0;
for (int i = 0 ; i < a.length ; i++)
    sum += a [i];
System.out.println ("The total is: " + sum);
```

5
```
//Average
int sum2 = 0;
for (int i = 0 ; i < a.length ; i++)
    sum2 += a [i];
System.out.println ("Average: " + (sum2 / a.length));
```

6
```
//Minimum, Smallest value
int min = a [0];
for (int i = 0 ; i < a.length ; i++)
{
    if (min > a [i])
min = a [i];
}
System.out.println ("The smallest value: " + min);
```

Find the mean value of the following array. Circle the code you need and adapt it.

```
int num[] = {5, 7, 3, 11, 76, 2, 90};
```

1
```
//Print horizontally
for (int i = 0 ; i < a.length ; i++)
    System.out.print (a [i] + " ");
System.out.println ();
```

2
```
//Print horizontally, greater than value
for (int i = 0 ; i < a.length ; i++)
{
    if (a [i] >= 5)
      System.out.print (a [i] + " ");
}
System.out.println ();
```

3
```
//Print vertically
for (int i = 0 ; i < a.length ; i++)
    System.out.println (a [i] + " ");
System.out.println ();
```

4
```
//Sum or Total
int sum = 0;
for (int i = 0 ; i < a.length ; i++)
    sum += a [i];
System.out.println ("The total is: " + sum);
```

5
```
//Average
int sum2 = 0;
for (int i = 0 ; i < a.length ; i++)
    sum2 += a [i];
System.out.println ("Average: " + (sum2 / a.length));
```

6
```
//Minimum, Smallest value
int min = a [0];
for (int i = 0 ; i < a.length ; i++)
{
    if (min > a [i])
min = a [i];
}
System.out.println ("The smallest value: " + min);
```

Sum, Average

Common Array Functions

Right Store. Right Price.

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(859) 223-0959 PHARMACY

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	AFL GOLD DEL PC	4.79 F
KROGER PLUS CUSTOMER		*******4398
SC 1200	AFL GOLD DE (2.00)	2.79-F
	AFL GOLD DEL PC	4.79 F
SC 1200	AFL GOLD DE (2.00)	2.79-F
	PRODUCE	0.99 F
	TAX	0.00
****	BALANCE	4.99
	CASH	20.00
	CHANGE	15.01
TOTAL NUMBER OF ITEMS SOLD =		3

********** KROGER SAVINGS **********

KROGER PLUS SAVINGS	$	5.58
TOTAL SAVINGS (52 pct.)	$	5.58

********** KROGER SAVINGS **********

11/04/09 01:12pm 371 80 84 131
****
Fuel Points Expiring 11/30/09 =139
****

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****
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****

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YOU SAVED $5.58 WITH YOUR PLUS CARD

ANNUAL KROGER PLUS SAVINGS $833.12

THANK YOU FOR SHOPPING KROGER

```
String name[] = {"Carrot", "Apple", "Soup", "Eggs"};
double cost[] = {0.99, 0.34, 0.89, 1.23};
```

	[0]	[1]	[2]	[3]
name	Carrot	Apple	Soup	Eggs
cost	0.99	0.34	0.89	1.23

```
String name[] = {"Carrot", "Apple", "Soup", "Eggs"};
double cost[] = {0.99, 0.34, 0.89, 1.23};
double sum = 0;
for (int i = 0 ; i < cost.length ; i++)
   sum += cost [i];
System.out.println ("\nThe bill total is $" + sum);
```

i	i<4	cost[i]	sum
			0
0	0<4=T	0.99	0.99
1	1<4=T	0.34	1.33
2	2<4=T	0.89	2.22
3	3<4=T	1.23	3.45
4	4<4=F		

	[0]	[1]	[2]	[3]
name	Carrot	Apple	Soup	Eggs
cost	0.99	0.34	0.89	1.23

```
String name[] = {"Carrot", "Apple", "Soup", "Eggs"};
double cost[] = {0.99, 0.34, 0.89, 1.23};
double sum = 0;
for (int i = 0 ; i < cost.length ; i++)
   sum += cost [i];
System.out.println ("\nThe bill total is $" + sum);
```

i	i<4	cost[i]	sum

	[0]	[1]	[2]	[3]
name	Carrot	Apple	Soup	Eggs
cost	0.99	0.34	0.89	1.23

```
String name[] = {"Carrot", "Apple", "Soup", "Eggs"};
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double sum = 0;
for (int i = 0 ; i < cost.length ; i++)
   sum += cost [i];
System.out.println ("\nThe bill total is $" + sum);
```

i	i<4	cost[i]	sum
			0

	[0]	[1]	[2]	[3]
name	Carrot	Apple	Soup	Eggs
cost	0.99	0.34	0.89	1.23

```
String name[] = {"Carrot", "Apple", "Soup", "Eggs"};
double cost[] = {0.99, 0.34, 0.89, 1.23};
double sum = 0;
for (int i = 0 ; i < cost.length ; i++)
   sum += cost [i];
System.out.println ("\nThe bill total is $" + sum);
```

i	i<4	cost[i]	sum
			0
0			

	[0]	[1]	[2]	[3]
name	Carrot	Apple	Soup	Eggs
cost	0.99	0.34	0.89	1.23

```
String name[] = {"Carrot", "Apple", "Soup", "Eggs"};
double cost[] = {0.99, 0.34, 0.89, 1.23};
double sum = 0;
for (int i = 0 ; i < cost.length ; i++)
   sum += cost [i];
System.out.println ("\nThe bill total is $" + sum);
```

i	i<4	cost[i]	sum
			0
0	0<4=T		

	[0]	[1]	[2]	[3]
name	Carrot	Apple	Soup	Eggs
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```
String name[] = {"Carrot", "Apple", "Soup", "Eggs"};
double cost[] = {0.99, 0.34, 0.89, 1.23};
double sum = 0;
for (int i = 0 ; i < cost.length ; i++)
   sum += cost [i];
System.out.println ("\nThe bill total is $" + sum);
```

i	i<4	cost[i]	sum
			0
0	0<4=T	0.99	0.99

	[0]	[1]	[2]	[3]
name	Carrot	Apple	Soup	Eggs
cost	0.99	0.34	0.89	1.23

```
String name[] = {"Carrot", "Apple", "Soup", "Eggs"};
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double sum = 0;
for (int i = 0 ; i < cost.length ; i++)
   sum += cost [i];
System.out.println ("\nThe bill total is $" + sum);
```

i	i<4	cost[i]	sum
			0
0	0<4=T	0.99	0.99
1			

	[0]	[1]	[2]	[3]
name	Carrot	Apple	Soup	Eggs
cost	0.99	0.34	0.89	1.23

```
String name[] = {"Carrot", "Apple", "Soup", "Eggs"};
double cost[] = {0.99, 0.34, 0.89, 1.23};
double sum = 0;
for (int i = 0 ; i < cost.length ; i++)
   sum += cost [i];
System.out.println ("\nThe bill total is $" + sum);
```

i	i<4	cost[i]	sum
			0
0	0<4=T	0.99	0.99
1	1<4=T		

	[0]	[1]	[2]	[3]
name	Carrot	Apple	Soup	Eggs
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```
String name[] = {"Carrot", "Apple", "Soup", "Eggs"};
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```

i	i<4	cost[i]	sum
			0
0	0<4=T	0.99	0.99
1	1<4=T	0.34	1.33

	[0]	[1]	[2]	[3]
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for (int i = 0 ; i < cost.length ; i++)
   sum += cost [i];
System.out.println ("\nThe bill total is $" + sum);
```

i	i<4	cost[i]	sum
			0
0	0<4=T	0.99	0.99
1	1<4=T	0.34	1.33
2			

	[0]	[1]	[2]	[3]
name	Carrot	Apple	Soup	Eggs
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```
String name[] = {"Carrot", "Apple", "Soup", "Eggs"};
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double sum = 0;
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   sum += cost [i];
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```

i	i<4	cost[i]	sum
			0
0	0<4=T	0.99	0.99
1	1<4=T	0.34	1.33
2	2<4=T		

	[0]	[1]	[2]	[3]
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```

i	i<4	cost[i]	sum
			0
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1	1<4=T	0.34	1.33
2	2<4=T	0.89	2.22

	[0]	[1]	[2]	[3]
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   sum += cost [i];
System.out.println ("\nThe bill total is $" + sum);
```

i	i<4	cost[i]	sum
			0
0	0<4=T	0.99	0.99
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3			

	[0]	[1]	[2]	[3]
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```

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for (int i = 0 ; i < cost.length ; i++)
    sum += cost [i];
System.out.println ("\nThe bill total is $" + sum);
```

i	i<4	cost[i]	sum
			0
0	0<4=T	0.99	0.99
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3	3<4=T	1.23	3.45

	[0]	[1]	[2]	[3]
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   sum += cost [i];
System.out.println ("\nThe bill total is $" + sum);
```

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			0
0	0<4=T	0.99	0.99
1	1<4=T	0.34	1.33
2	2<4=T	0.89	2.22
3	3<4=T	1.23	3.45
4			

	[0]	[1]	[2]	[3]
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```
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double sum = 0;
for (int i = 0 ; i < cost.length ; i++)
   sum += cost [i];
System.out.println ("\nThe bill total is $" + sum);
```

i	i<4	cost[i]	sum
			0
0	0<4=T	0.99	0.99
1	1<4=T	0.34	1.33
2	2<4=T	0.89	2.22
3	3<4=T	1.23	3.45
4	4<4=F		

	[0]	[1]	[2]	[3]
name	Carrot	Apple	Soup	Eggs
cost	0.99	0.34	0.89	1.23

To make it into the average,
just add this line:

```
double average = sum /cost.length;
```

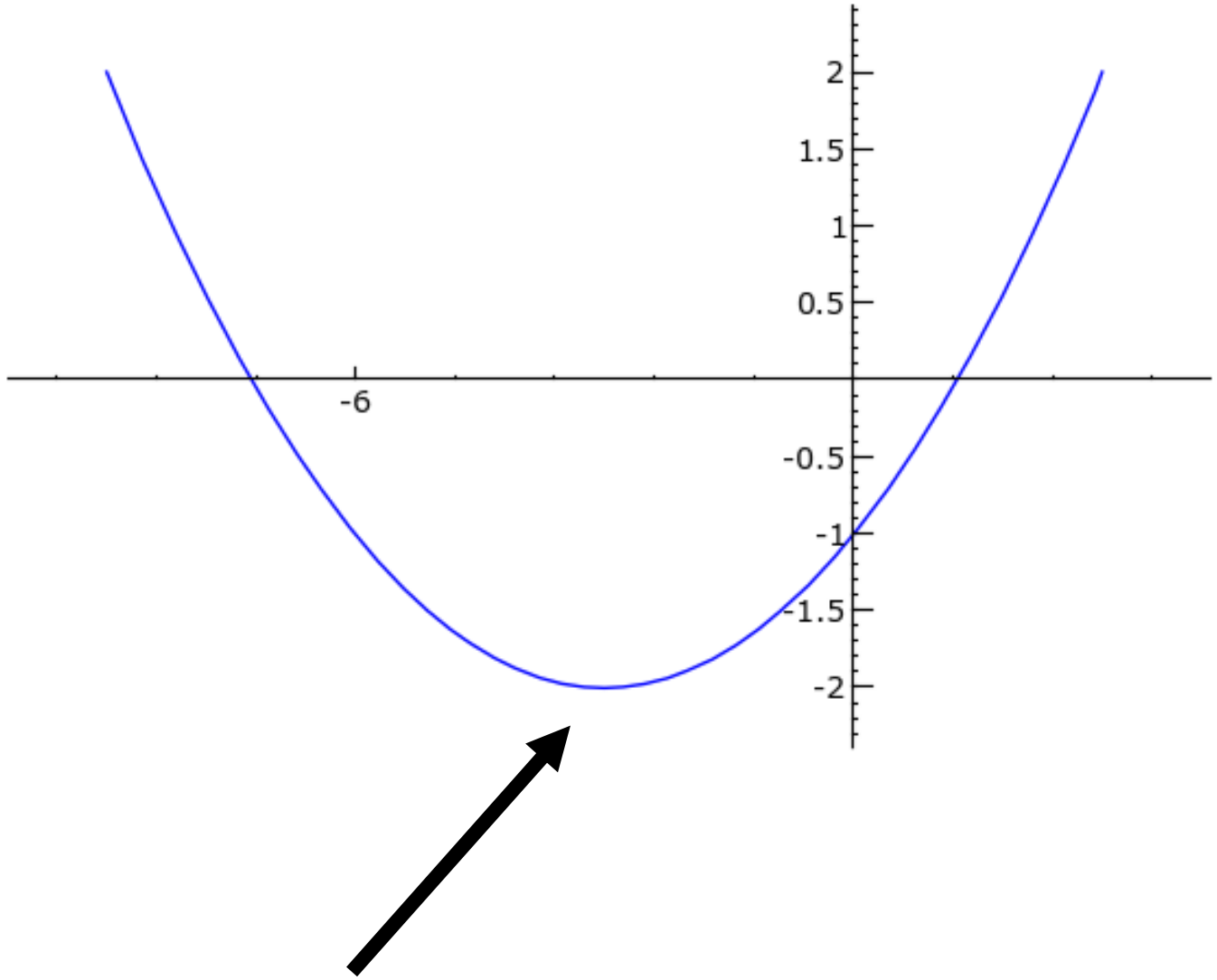
```
String name[] = {"Carrot", "Apple", "Soup", "Eggs"};
double cost[] = {0.99, 0.34, 0.89, 1.23};
double sum = 0;
for (int i = 0 ; i < cost.length ; i++)
    sum += cost [i];
double avg = sum / cost.length;
System.out.println ("\nAverage cost is $" + avg);
```

Min, Max

Common Array Functions

Reminder:

	String	char, int, double
Less than	X.compareTo(Y)<0	X<Y
Greater than	X.compareTo(Y)>0	X>Y
Equals	X.equals(Y)	X==Y



Finding the Minimum

```
String rain [ ] = {“red”, “orange”, “yellow”,
“green”, “blue”, “purple”};
```

rain

[0]	[1]	[2]	[3]	[4]	[5]
Red	Orange	Yellow	Green	Blue	Purple

```
String min = rain[0];
for (int i=1; i<rain.length; i++)
{   if (rain[i].compareTo(min)<0)
       min = rain[i];
}
System.out.println("The minimum is "+min);
```

Have a holder variable "min".

Start off with the 0^{th} element.

Go through the rest of the array, one by one.

At each place compare min to the array element.

If the element is smaller, replace min.

After you are finished going through the array, you will have the smallest element in min.

```
String min = rain[0];
for (int i=1; i<rain.length; i++)
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System.out.println("The minimum is "+min);
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       min = rain[i];
}
System.out.println("The minimum is "+min);
```

Have a holder variable "min".

Start off with the 0^{th} element.

Go through the rest of the array, one by one.

At each place compare min to the array element.

If the element is smaller, replace min.

After you are finished going through the array, you will have the smallest element in min.

[0]	[1]	[2]	[3]	[4]	[5]
Red	Orange	Yellow	Green	Blue	Purple

```
String min = rain[0];
for (int i=1; i<rain.length; i++)
{    if (rain[i].compareTo(min)<0)
        min = rain[i];
}
System.out.println("The minimum is "+min);
```


Min

Red

[0]	[1]	[2]	[3]	[4]	[5]
Red	Orange	Yellow	Green	Blue	Purple

```
String min = rain[0];
for (int i=1; i<rain.length; i++)
{    if (rain[i].compareTo(min)<0)
        min = rain[i];
}
System.out.println("The minimum is "+min);
```

i=1			

Min

Red

[0]	[1]	[2]	[3]	[4]	[5]
Red	Orange	Yellow	Green	Blue	Purple

```
String min = rain[0];
for (int i=1; i<rain.length; i++)
{    if (rain[i].compareTo(min)<0)
        min = rain[i];
}
System.out.println("The minimum is "+min);
```

i=1	1<6=T		

Min

Red

[0]	[1]	[2]	[3]	[4]	[5]
Red	Orange	Yellow	Green	Blue	Purple

```
String min = rain[0];
for (int i=1; i<rain.length; i++)
{   if (rain[i].compareTo(min)<0)
       min = rain[i];
}
System.out.println("The minimum is "+min);
```

i=1	1<6=T	rain[1]=orange	orange<red = T

Min

Red

[0]	[1]	[2]	[3]	[4]	[5]
Red	Orange	Yellow	Green	Blue	Purple

```
String min = rain[0];
for (int i=1; i<rain.length; i++)
{   if (rain[i].compareTo(min)<0)
       min = rain[i];
}
System.out.println("The minimum is "+min);
```

i=1	1<6=T	rain[1]=orange	orange<red = T

Min

Red

Orange

[0]	[1]	[2]	[3]	[4]	[5]
Red	Orange	Yellow	Green	Blue	Purple

```
String min = rain[0];
for (int i=1; i<rain.length; i++)
{   if (rain[i].compareTo(min)<0)
       min = rain[i];
}
System.out.println("The minimum is "+min);
```

i=1	1<6=T	rain[1]=orange	orange<red = T
i=2			

Min

Red

Orange

[0]	[1]	[2]	[3]	[4]	[5]
Red	Orange	Yellow	Green	Blue	Purple

```
String min = rain[0];
for (int i=1; i<rain.length; i++)
{   if (rain[i].compareTo(min)<0)
       min = rain[i];
}
System.out.println("The minimum is "+min);
```

i=1	1<6=T	rain[1]=orange	orange<red = T
i=2	2<6=T		

Min

Red

Orange

[0]	[1]	[2]	[3]	[4]	[5]
Red	Orange	Yellow	Green	Blue	Purple

```
String min = rain[0];
for (int i=1; i<rain.length; i++)
{   if (rain[i].compareTo(min)<0)
       min = rain[i];
}
System.out.println("The minimum is "+min);
```

i=1	1<6=T	rain[1]=orange	orange<red = T
i=2	2<6=T	rain[2]=yellow	yellow<orange=F

Min

Red

Orange

[0]	[1]	[2]	[3]	[4]	[5]
Red	Orange	Yellow	Green	Blue	Purple

```
String min = rain[0];
for (int i=1; i<rain.length; i++)
{   if (rain[i].compareTo(min)<0)
       min = rain[i];
}
System.out.println("The minimum is "+min);
```

i=1	1<6=T	rain[1]=orange	orange<red = T
i=2	2<6=T	rain[2]=yellow	yellow<orange=F
i=3			

Min

Red

Orange

[0]	[1]	[2]	[3]	[4]	[5]
Red	Orange	Yellow	Green	Blue	Purple

```
String min = rain[0];
for (int i=1; i<rain.length; i++)
{   if (rain[i].compareTo(min)<0)
       min = rain[i];
}
System.out.println("The minimum is "+min);
```

i=1	1<6=T	rain[1]=orange	orange<red = T
i=2	2<6=T	rain[2]=yellow	yellow<orange=F
i=3	3<6=T		

Min

Red

Orange

[0]	[1]	[2]	[3]	[4]	[5]
Red	Orange	Yellow	Green	Blue	Purple

```
String min = rain[0];
for (int i=1; i<rain.length; i++)
{   if (rain[i].compareTo(min)<0)
        min = rain[i];
}
System.out.println("The minimum is "+min);
```

i=1	1<6=T	rain[1]=orange	orange<red = T
i=2	2<6=T	rain[2]=yellow	yellow<orange=F
i=3	3<6=T	rain[3]=green	green<orange=T

Min

Red

Orange

[0]	[1]	[2]	[3]	[4]	[5]
Red	Orange	Yellow	Green	Blue	Purple

```
String min = rain[0];
for (int i=1; i<rain.length; i++)
{   if (rain[i].compareTo(min)<0)
       min = rain[i];
}
System.out.println("The minimum is "+min);
```

i=1	1<6=T	rain[1]=orange	orange<red = T
i=2	2<6=T	rain[2]=yellow	yellow<orange=F
i=3	3<6=T	rain[3]=green	green<orange=T

Min

Red

Orange

Green

[0]	[1]	[2]	[3]	[4]	[5]
Red	Orange	Yellow	Green	Blue	Purple

```
String min = rain[0];
for (int i=1; i<rain.length; i++)
{   if (rain[i].compareTo(min)<0)
       min = rain[i];
}
System.out.println("The minimum is "+min);
```

i=1	1<6=T	rain[1]=orange	orange<red = T
i=2	2<6=T	rain[2]=yellow	yellow<orange=F
i=3	3<6=T	rain[3]=green	green<orange=T
i=4			

Min

Red

Orange

Green

[0]	[1]	[2]	[3]	[4]	[5]
Red	Orange	Yellow	Green	Blue	Purple

```
String min = rain[0];
for (int i=1; i<rain.length; i++)
{   if (rain[i].compareTo(min)<0)
       min = rain[i];
}
System.out.println("The minimum is "+min);
```

i=1	1<6=T	rain[1]=orange	orange<red = T
i=2	2<6=T	Rain[2]=yellow	yellow<orange=F
i=3	3<6=T	Rain[3]=green	green<orange=T
i=4	4<6=T	Rain[4]=blue	Blue<green=T
i=5	5<6=T	Rain[5]=purple	purple<blue=F
i=6	6<6=F		

Min

Red

Orange

Green

[0]	[1]	[2]	[3]	[4]	[5]
Red	Orange	Yellow	Green	Blue	Purple

```
String min = rain[0];
for (int i=1; i<rain.length; i++)
{   if (rain[i].compareTo(min)<0)
        min = rain[i];
}
System.out.println("The minimum is "+min);
```

i=1	1<6=T	rain[1]=orange	orange<red = T
i=2	2<6=T	Rain[2]=yellow	yellow<orange=F
i=3	3<6=T	Rain[3]=green	green<orange=T
i=4	4<6=T	rain[4]=blue	blue<green=T

Min

Red

Orange

Green

[0]	[1]	[2]	[3]	[4]	[5]
Red	Orange	Yellow	Green	Blue	Purple

```
String min = rain[0];
for (int i=1; i<rain.length; i++)
{   if (rain[i].compareTo(min)<0)
       min = rain[i];
}
System.out.println("The minimum is "+min);
```

i=1	1<6=T	rain[1]=orange	orange<red = T
i=2	2<6=T	rain[2]=yellow	yellow<orange=F
i=3	3<6=T	rain[3]=green	green<orange=T
i=4	4<6=T	rain[4]=blue	Blue<green=T

Min

Red

Orange

Green

Blue

[0]	[1]	[2]	[3]	[4]	[5]
Red	Orange	Yellow	Green	Blue	Purple

```
String min = rain[0];
for (int i=1; i<rain.length; i++)
{   if (rain[i].compareTo(min)<0)
       min = rain[i];
}
System.out.println("The minimum is "+min);
```

i=1	1<6=T	rain[1]=orange	orange<red = T
i=2	2<6=T	rain[2]=yellow	yellow<orange=F
i=3	3<6=T	rain[3]=green	green<orange=T
i=4	4<6=T	rain[4]=blue	Blue<green=T
i=5			

Min

Red

Orange

Green

Blue

[0]	[1]	[2]	[3]	[4]	[5]
Red	Orange	Yellow	Green	Blue	Purple

```
String min = rain[0];
for (int i=1; i<rain.length; i++)
{   if (rain[i].compareTo(min)<0)
       min = rain[i];
}
System.out.println("The minimum is "+min);
```

i=1	1<6=T	rain[1]=orange	orange<red = T
i=2	2<6=T	rain[2]=yellow	yellow<orange=F
i=3	3<6=T	rain[3]=green	green<orange=T
i=4	4<6=T	rain[4]=blue	blue<green=T
i=5	5<6=T		

Min

Red

Orange

Green

Blue

[0]	[1]	[2]	[3]	[4]	[5]
Red	Orange	Yellow	Green	Blue	Purple

```
String min = rain[0];
for (int i=1; i<rain.length; i++)
{   if (rain[i].compareTo(min)<0)
        min = rain[i];
}
System.out.println("The minimum is "+min);
```

i=1	1<6=T	rain[1]=orange	orange<red = T
i=2	2<6=T	rain[2]=yellow	yellow<orange=F
i=3	3<6=T	rain[3]=green	green<orange=T
i=4	4<6=T	rain[4]=blue	blue<green=T
i=5	5<6=T	rain[5]=purple	purple<blue=F

Min

Red

Orange

Green

Blue

[0]	[1]	[2]	[3]	[4]	[5]
Red	Orange	Yellow	Green	Blue	Purple

```
String min = rain[0];
for (int i=1; i<rain.length; i++)
{   if (rain[i].compareTo(min)<0)
       min = rain[i];
}
System.out.println("The minimum is "+min);
```

i=1	1<6=T	rain[1]=orange	orange<red = T
i=2	2<6=T	Rain[2]=yellow	yellow<orange=F
i=3	3<6=T	Rain[3]=green	green<orange=T
i=4	4<6=T	Rain[4]=blue	Blue<green=T
i=5	5<6=T	Rain[5]=purple	purple<blue=F
i=6			

Min

Red

Orange

Green

Blue

[0]	[1]	[2]	[3]	[4]	[5]
Red	Orange	Yellow	Green	Blue	Purple

```
String min = rain[0];
for (int i=1; i<rain.length; i++)
{   if (rain[i].compareTo(min)<0)
       min = rain[i];
}
System.out.println("The minimum is "+min);
```

i=1	1<6=T	rain[1]=orange	orange<red = T
i=2	2<6=T	Rain[2]=yellow	yellow<orange=F
i=3	3<6=T	Rain[3]=green	green<orange=T
i=4	4<6=T	Rain[4]=blue	Blue<green=T
i=5	5<6=T	Rain[5]=purple	purple<blue=F
i=6	6<6=F		

Min

Red

Orange

Green

Blue

[0]	[1]	[2]	[3]	[4]	[5]
Red	Orange	Yellow	Green	Blue	Purple

```
String min = rain[0];
for (int i=1; i<rain.length; i++)
{   if (rain[i].compareTo(min)<0)
       min = rain[i];
}
System.out.println("The minimum is "+ min);
```

i=1	1<6=T	rain[1]=orange	orange<red = T
i=2	2<6=T	rain[2]=yellow	yellow<orange=F
i=3	3<6=T	rain[3]=green	green<orange=T
i=4	4<6=T	rain[4]=blue	blue<green=T
i=5	5<6=T	rain[5]=purple	purple<blue=F
i=6	6<6=F		

Min

Red

Orange

Green

Blue

Two simple changes to make it maximum.

1. Change the variable name to keep it readable.

2. Change the < sign to >.

```
String max = rain[0];
for (int i=1; i<rain.length; i++)
{   if (rain[i].compareTo(max)>0)
       max = rain[i];
}
System.out.println("The maximum is "+ max);
```

Have a holder variable "max".

Start off with the 0^{th} element.

Go through the rest of the array, one by one.

At each place compare max to the array element.

If the element is **bigger**, replace max.

After you are finished going through the array, you will have the smallest element in max.