Let's break down the provided Java code line by line:

java

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import java.util.\*;

This line imports the java.util package, which includes utility classes such as Scanner for user input.

java

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public class Bully {

This line starts the class definition for a class named Bully. This class encapsulates the Bully algorithm's implementation.

java

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int coordinator;

int max\_processes;

boolean processes[];

These lines declare instance variables for the Bully class.

coordinator: Represents the process ID of the current coordinator.

max\_processes: Represents the maximum number of processes in the system.

processes[]: Represents an array to track the status of each process in the system.

java

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public Bully(int max) {

This line defines the constructor method for the Bully class. It takes an integer argument max representing the maximum number of processes in the system.

java

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max\_processes = max;

processes = new boolean[max\_processes];

coordinator = max;

These lines initialize the instance variables in the constructor:

max\_processes is set to the value passed as an argument.

An array processes of boolean values is initialized with size max\_processes, representing the status (up or down) of each process.

coordinator is initially set to the maximum process ID, indicating that the coordinator is initially assumed to be the process with the highest ID.

java

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System.out.println("Creating processes..");

This line prints a message indicating that processes are being created.

java

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for(int i = 0; i < max; i++) {

This line starts a loop to initialize the status of each process.

The loop iterates from 0 to max - 1.

java

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processes[i] = true;

System.out.println("P"+ (i+1) + " created");

These lines set the status of each process to true (representing that the process is up) and print a message indicating the creation of each process with its ID.

java

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System.out.println("Process P" + coordinator + " is the coordinator");

This line prints a message indicating the initial coordinator process.

java

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void displayProcesses() {

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- This line defines a method named `displayProcesses()`, which is used to display the status of each process in the system.

11. ```java

for(int i = 0; i < max\_processes; i++) {

This line starts a loop to iterate over each process in the system.

java

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if(processes[i]) {

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- This line checks if the current process (with index `i`) is up.

13. ```java

System.out.println("P" + (i+1) + " is up");

This line prints a message indicating that the current process (with ID (i+1)) is up.

java

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} else {

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- This line executes if the current process is not up (i.e., it's down).

15. ```java

System.out.println("P" + (i+1) + " is down");

This line prints a message indicating that the current process (with ID (i+1)) is down.

java

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System.out.println("Process P" + coordinator + " is the coordinator");

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- This line prints a message indicating the current coordinator process.

17. ```java

void upProcess(int process\_id) {

This line defines a method named upProcess(int process\_id), which is used to bring a down process up.

java

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if(!processes[process\_id - 1]) {

csharp

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- This line checks if the process with the specified ID is currently down.

19. ```java

processes[process\_id - 1] = true;

System.out.println("Process " + process\_id + " is now up.");

These lines set the status of the specified process to up and print a message indicating that the process is now up.

java

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} else {

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- This line executes if the specified process is already up.

21. ```java

System.out.println("Process " + process\_id + " is already up.");

This line prints a message indicating that the specified process is already up.

java

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void downProcess(int process\_id) {

scss

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- This line defines a method named `downProcess(int process\_id)`, which is used to bring a process down.

23. ```java

if(!processes[process\_id - 1]) {

This line checks if the process with the specified ID is already down.

java

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System.out.println("Process " + process\_id + " is already down.");

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- This line prints a message indicating that the specified process is already down.

25. ```java