**import** java.util.ArrayList;  
**import** java.util.concurrent.ThreadLocalRandom;  
  
**public class** Main {  
 **public static** String *wilt* = **"MW"**;  
 **public static** String *healthy* = **"HM"**;  
 **public static** String *dmd* = **"DM"**;  
 **public int year** = 50;  
  
 **public static void** main(String[] args) {*//Start of main* ArrayList<Man> men = **new** ArrayList<>(10);*//Agents  
 //Fill list of agents* men.add(**new** Man(**new** String[5][5], 50));  
 men.add(**new** Man(**new** String[5][5], 61));  
 men.add(**new** Man(**new** String[5][5], 53));  
 men.add(**new** Man(**new** String[5][5], 60));  
 men.add(**new** Man(**new** String[5][5], 75));  
 men.add(**new** Man(**new** String[5][5], 90));  
 men.add(**new** Man(**new** String[5][5], 50));  
 men.add(**new** Man(**new** String[5][5], 52));  
 men.add(**new** Man(**new** String[5][5], 65));  
 men.add(**new** Man(**new** String[5][5], 50));  
 **for** (**int** i = 0; i < 10; i++) {*//Loops agents* **for** (**int** j = 0; j < 10; j++) {*//Loop year  
 fill*(men.get(i).**dna**);  
 men.get(i).infect();  
 men.get(i).spread();  
  
 **if** (i == 0) {  
 men.get(i).youthFirst();  
 } **else** {  
 men.get(i).youth();  
 }  
 men.get(i).cure();  
 men.get(i).countHealthy();

men.get(i).**age**++;

}  
 }  
 **for** (**int** j = 0; j < men.size(); j++) {*//Print each final agent* System.***out***.println(**"Person "** + (j + 1) + **"\nAge: "** + men.get(j).**age**);  
 System.***out***.println(**"Average healthy cells: "** + men.get(j).**healthyTotal** / 10);  
 *printGrid*(men.get(j).**dna**);  
 }  
 }*//End of main* **static** String[][] fill(String[][] a) {*//Start of fill* **for** (**int** j = 0; j < 5; j++) {  
 **for** (**int** i = 0; i < 5; i++) {  
 a[j][i] = **"HM"**;*//Fill with cells* }  
 }  
 **return** a;  
 }  
  
 **static void** printGrid(String[][] a) {*//Prints 2d array* **for** (**int** j = 0; j < 5; j++) {  
 **for** (**int** i = 0; i < 5; i++) {  
 System.***out***.print(a[j][i] + **" "**);  
 }  
 System.***out***.print(**"\n"**);  
 }  
 }  
  
  
}

**import** java.util.concurrent.ThreadLocalRandom;  
  
**public class** Man {*//Start of man class* **protected int age**;*//Man's age* **protected** String[][] **dna**;*//DNA grid* **protected int healthyTotal** = 0;*//Count of total healthy cells* **public** Man(String[][] a, **int** b) {*//Start of man constructor* **this**.**dna** = a;  
 **this**.**age** = b;  
 }*//End of man constructor* **public void** youth() {*//Youth cell injector* String[][] a = **this**.**dna**;  
 **int** counter = 0;  
 **for** (**int** j = 0; j < 5; j++) {  
 **for** (**int** i = 0; i < 5; i++) {  
 **if** (a[j][i].equals(**"DM"**) || a[j][i].equals(**"MW"**)) {*//Check if unhealthy* **if** (counter < 4) {*//Cure if possible* a[j][i] = **"YS"**;  
 counter++;  
 }  
 }  
 }  
 }  
 **this**.**dna** = a;  
 }*//End of cell injector* **public void** youthFirst() {*//Initial Youth cell injector* String[][] a = **this**.**dna**;  
 **int** counter = 0;  
 **for** (**int** j = 0; j < 5; j++) {  
 **for** (**int** i = 0; i < 5; i++) {  
 **if** (a[j][i].equals(**"DM"**) || a[j][i].equals(**"MW"**)) {*//Check if unhealthy* **if** (counter < 6) {*//Cure if possible* a[j][i] = **"YS"**;  
 counter++;  
 }  
 }  
 }  
 }  
 **this**.**dna** = a;  
 }*//End of cell injector* **public void** spread() {*//Start of spread* String[][] a = **this**.**dna**;  
 **int** ran = 0;  
 **for** (**int** j = 0; j < 5; j++) {  
 **for** (**int** i = 0; i < 5; i++) {  
 **if** (a[j][i].equals(Main.*dmd*)) {  
 ran = *getRandomValue*(0, 100);*//Random chance* **if** (j != 0 && ran <= 15) {*//Above* a[j - 1][i] = **"DM"**;  
 }  
 ran = *getRandomValue*(0, 100);*//Random chance* **if** (j != 4 && ran <= 15) {*//below* a[j + 1][i] = **"DM"**;  
 }  
 ran = *getRandomValue*(0, 100);*//Random chance* **if** (i != 0 && ran <= 35) {*//Left* a[j][i - 1] = **"DM"**;  
 }  
 ran = *getRandomValue*(0, 100);*//Random chance* **if** (i != 4 && ran <= 35) {*//Right* a[j][i + 1] = **"DM"**;  
 }  
 }  
 }  
 }  
 **this**.**dna** = a;  
 }*//End of spread* **public void** infect() {*//Start of infect* String[][] a = **this**.**dna**;  
 **int** ran = 0;  
 **for** (**int** j = 0; j < 5; j++) {  
 **for** (**int** i = 0; i < 5; i++) {  
 ran = *getRandomValue*(0, 100);*//Infection chance* **if** (ran <= 5) {  
 a[j][i] = **"DM"**;  
 ran = *getRandomValue*(0, 100);*//Direction of wilt* **if** (ran <= 25 && j != 0 && a[j - 1][i].equals(**"HM"**)) {  
 a[j - 1][i] = **"MW"**;  
 } **else if** (ran > 25 && ran <= 50 && j != 4 && a[j + 1][i].equals(**"HM"**)) {  
 a[j + 1][i] = **"MW"**;  
 } **else if** (ran > 50 && ran <= 75 && i != 0 && a[j][i - 1].equals(**"HM"**)) {  
 a[j][i - 1] = **"MW"**;  
 } **else if** (ran > 75 && ran <= 100 && i != 4 && a[j][i + 1].equals(**"HM"**)) {  
 a[j][i + 1] = **"MW"**;  
 }  
 }  
 }  
 }  
 **this**.**dna** = a;  
 }*//End of infect* **public void** countHealthy() {*//Start of counts healthy cells* **for** (**int** j = 0; j < 5; j++) {  
 **for** (**int** i = 0; i < 5; i++) {  
 **if** (**this**.**dna**[j][i] == **"HM"**) {  
 **this**.**healthyTotal**++;  
 }  
 }  
 }  
 }*//End of countHealthy* **public void** cure() {*//Start of cure* **int** ran = 0;  
 **for** (**int** j = 0; j < 5; j++) {  
 **for** (**int** i = 0; i < 5; i++) {  
 **if** (**this**.**dna**[j][i] == **"YS"**) {  
 ran = *getRandomValue*(0, 100);*//Chance of cure* **if** (**this**.**age** >= 80) {*//if man is over 80* **if** (j != 0 && (**this**.**dna**[j - 1][i].equals(**"DM"**) || **this**.**dna**[j - 1][i].equals(**"MW"**) && ran > 30)) {*//near up* **this**.**dna**[j - 1][i] = **"HM"**;  
 }  
 **if** ((j != 1 && j != 0) && (**this**.**dna**[j - 2][i].equals(**"DM"**) || **this**.**dna**[j - 2][i].equals(**"MW"**) && ran > 40)) {*//far up* **this**.**dna**[j - 2][i] = **"HM"**;  
 }  
 **if** (j != 4 && (**this**.**dna**[j + 1][i].equals(**"DM"**) || **this**.**dna**[j + 1][i].equals(**"MW"**) && ran > 30)) {*//near down* **this**.**dna**[j + 1][i] = **"HM"**;  
 }  
 **if** ((j != 4 && j != 3) && (**this**.**dna**[j + 2][i].equals(**"DM"**) || **this**.**dna**[j + 2][i].equals(**"MW"**) && ran > 40)) {*//far down* **this**.**dna**[j + 2][i] = **"HM"**;  
 }  
 **if** (i != 0 && (**this**.**dna**[j][i - 1].equals(**"DM"**) || **this**.**dna**[j][i - 1].equals(**"MW"**) && ran > 30)) {*//near left* **this**.**dna**[j][i - 1] = **"HM"**;  
 }  
 **if** ((i != 1 && i != 0) && (**this**.**dna**[j][i - 2].equals(**"DM"**) || **this**.**dna**[j][i - 2].equals(**"MW"**) && ran > 40)) {*//far left* **this**.**dna**[j][i - 2] = **"HM"**;  
 }  
 **if** (i != 4 && (**this**.**dna**[j][i + 1].equals(**"DM"**) || **this**.**dna**[j][i + 1].equals(**"MW"**) && ran > 30)) {*//near right* **this**.**dna**[j][i + 1] = **"HM"**;  
 }  
 **if** ((i != 4 && i != 3) && (**this**.**dna**[j][i + 2].equals(**"DM"**) || **this**.**dna**[j][i + 2].equals(**"MW"**) && ran > 40)) {*//far right* **this**.**dna**[j][i + 2] = **"HM"**;  
 }  
 } **else if** (**this**.**age** >= 70) {*//if is in seventies* **if** (j != 0 && (**this**.**dna**[j - 1][i].equals(**"DM"**) || **this**.**dna**[j - 1][i].equals(**"MW"**) && ran > 25)) {  
 **this**.**dna**[j - 1][i] = **"HM"**;  
 }  
 **if** ((j != 1 && j != 0) && (**this**.**dna**[j - 2][i].equals(**"DM"**) || **this**.**dna**[j - 2][i].equals(**"MW"**) && ran > 30)) {  
 **this**.**dna**[j - 2][i] = **"HM"**;  
 }  
 **if** (j != 4 && (**this**.**dna**[j + 1][i].equals(**"DM"**) || **this**.**dna**[j + 1][i].equals(**"MW"**) && ran > 25)) {  
 **this**.**dna**[j + 1][i] = **"HM"**;  
 }  
 **if** ((j != 4 && j != 3) && (**this**.**dna**[j + 2][i].equals(**"DM"**) || **this**.**dna**[j + 2][i].equals(**"MW"**) && ran > 30)) {  
 **this**.**dna**[j + 2][i] = **"HM"**;  
 }  
 **if** (i != 0 && (**this**.**dna**[j][i - 1].equals(**"DM"**) || **this**.**dna**[j][i - 1].equals(**"MW"**) && ran > 25)) {  
 **this**.**dna**[j][i - 1] = **"HM"**;  
 }  
 **if** ((i != 1 && i != 0) && (**this**.**dna**[j][i - 2].equals(**"DM"**) || **this**.**dna**[j][i - 2].equals(**"MW"**) && ran > 30)) {  
 **this**.**dna**[j][i - 2] = **"HM"**;  
 }  
 **if** (i != 4 && (**this**.**dna**[j][i + 1].equals(**"DM"**) || **this**.**dna**[j][i + 1].equals(**"MW"**) && ran > 25)) {  
 **this**.**dna**[j][i + 1] = **"HM"**;  
 }  
 **if** ((i != 4 && i != 3) && (**this**.**dna**[j][i + 2].equals(**"DM"**) || **this**.**dna**[j][i + 2].equals(**"MW"**) && ran > 30)) {  
 **this**.**dna**[j][i + 2] = **"HM"**;  
 }  
 }  
 **else if**(**this**.**age** >=60){*//if in sixties* **if**(j!=0 && (**this**.**dna**[j-1][i].equals(**"DM"**) || **this**.**dna**[j-1][i].equals(**"MW"**)&& ran >20)){  
 **this**.**dna**[j-1][i]= **"HM"**;  
 }  
 **if**((j!=1&&j!=0) && (**this**.**dna**[j-2][i].equals(**"DM"**) || **this**.**dna**[j-2][i].equals(**"MW"**)&& ran >26)){  
 **this**.**dna**[j-2][i]= **"HM"**;  
 }  
 **if**(j!=4 && (**this**.**dna**[j+1][i].equals(**"DM"**) || **this**.**dna**[j+1][i].equals(**"MW"**)&& ran >20)){  
 **this**.**dna**[j+1][i]= **"HM"**;  
 }  
 **if**((j!=4&&j!=3) && (**this**.**dna**[j+2][i].equals(**"DM"**) || **this**.**dna**[j+2][i].equals(**"MW"**)&& ran >26)){  
 **this**.**dna**[j+2][i]= **"HM"**;  
 }  
 **if**(i!=0 && (**this**.**dna**[j][i-1].equals(**"DM"**) || **this**.**dna**[j][i-1].equals(**"MW"**)&& ran >20)){  
 **this**.**dna**[j][i-1]= **"HM"**;  
 }  
 **if**((i!=1&&i!=0) && (**this**.**dna**[j][i-2].equals(**"DM"**) || **this**.**dna**[j][i-2].equals(**"MW"**)&& ran >26)){  
 **this**.**dna**[j][i-2]= **"HM"**;  
 }  
 **if**(i!=4 && (**this**.**dna**[j][i+1].equals(**"DM"**) || **this**.**dna**[j][i+1].equals(**"MW"**)&& ran >20)){  
 **this**.**dna**[j][i+1]= **"HM"**;  
 }  
 **if**((i!=4&&i!=3) && (**this**.**dna**[j][i+2].equals(**"DM"**) || **this**.**dna**[j][i+2].equals(**"MW"**)&& ran >26)){  
 **this**.**dna**[j][i+2]= **"HM"**;  
 }  
 }  
 **else**{*//fifties* **if**(j!=0 && (**this**.**dna**[j-1][i].equals(**"DM"**) || **this**.**dna**[j-1][i].equals(**"MW"**)&& ran >15)){  
 **this**.**dna**[j-1][i]= **"HM"**;  
 }  
 **if**((j!=1&&j!=0) && (**this**.**dna**[j-2][i].equals(**"DM"**) || **this**.**dna**[j-2][i].equals(**"MW"**)&& ran >19)){  
 **this**.**dna**[j-2][i]= **"HM"**;  
 }  
 **if**(j!=4 && (**this**.**dna**[j+1][i].equals(**"DM"**) || **this**.**dna**[j+1][i].equals(**"MW"**)&& ran >15)){  
 **this**.**dna**[j+1][i]= **"HM"**;  
 }  
 **if**((j!=4&&j!=3) && (**this**.**dna**[j+2][i].equals(**"DM"**) || **this**.**dna**[j+2][i].equals(**"MW"**)&& ran >19)){  
 **this**.**dna**[j+2][i]= **"HM"**;  
 }  
 **if**(i!=0 && (**this**.**dna**[j][i-1].equals(**"DM"**) || **this**.**dna**[j][i-1].equals(**"MW"**)&& ran >15)){  
 **this**.**dna**[j][i-1]= **"HM"**;  
 }  
 **if**((i!=1&&i!=0) && (**this**.**dna**[j][i-2].equals(**"DM"**) || **this**.**dna**[j][i-2].equals(**"MW"**)&& ran >19)){  
 **this**.**dna**[j][i-2]= **"HM"**;  
 }  
 **if**(i!=4 && (**this**.**dna**[j][i+1].equals(**"DM"**) || **this**.**dna**[j][i+1].equals(**"MW"**)&& ran >15)){  
 **this**.**dna**[j][i+1]= **"HM"**;  
 }  
 **if**((i!=4&&i!=3) && (**this**.**dna**[j][i+2].equals(**"DM"**) || **this**.**dna**[j][i+2].equals(**"MW"**)&& ran >19)){  
 **this**.**dna**[j][i+2]= **"HM"**;  
 }  
 }  
 }  
 }  
 }  
 }*//End of cure* **static int** getRandomValue(**int** Min, **int** Max) {*//Start of random value generator* **return** ThreadLocalRandom  
 .*current*()  
 .nextInt(Min, Max + 1);  
 }*//End of random value generator*}*//End of man class*

Base Case Output:

"C:\Program Files\Java\jdk-10.0.2\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2018.2.2\lib\idea\_rt.jar=51741:C:\Program Files\JetBrains\IntelliJ IDEA 2018.2.2\bin" -Dfile.encoding=UTF-8 -classpath C:\Users\thund\IdeaProjects\MuscleWilt\out\production\MuscleWilt Main

Person 1

Age: 60

Average healthy cells: 22

HM HM HM HM DM

HM HM HM HM DM

HM HM HM HM MW

MW HM HM HM HM

DM DM DM HM HM

Person 2

Age: 71

Average healthy cells: 20

HM HM HM HM HM

HM HM DM MW HM

HM DM HM HM HM

DM DM HM HM HM

HM HM HM HM HM

Person 3

Age: 63

Average healthy cells: 19

DM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

Person 4

Age: 70

Average healthy cells: 22

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

Person 5

Age: 85

Average healthy cells: 22

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

HM DM HM HM HM

Person 6

Age: 100

Average healthy cells: 22

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

Person 7

Age: 60

Average healthy cells: 19

DM DM MW HM HM

DM DM DM HM HM

DM DM DM HM HM

DM HM HM HM HM

DM DM HM HM HM

Person 8

Age: 62

Average healthy cells: 20

HM HM HM MW DM

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

Person 9

Age: 75

Average healthy cells: 22

HM HM HM HM HM

HM DM HM HM HM

DM DM HM HM HM

HM DM HM HM HM

HM HM HM DM MW

Person 10

Age: 60

Average healthy cells: 21

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

Process finished with exit code 0

Youth Output:

"C:\Program Files\Java\jdk-10.0.2\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2018.2.2\lib\idea\_rt.jar=51730:C:\Program Files\JetBrains\IntelliJ IDEA 2018.2.2\bin" -Dfile.encoding=UTF-8 -classpath C:\Users\thund\IdeaProjects\MuscleWilt\out\production\MuscleWilt Main

Person 1

Age: 60

Average healthy cells: 22

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

Person 2

Age: 71

Average healthy cells: 23

HM HM HM HM HM

HM HM HM HM HM

HM HM HM YS YS

HM HM HM HM YS

HM HM HM HM HM

Person 3

Age: 63

Average healthy cells: 20

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

Person 4

Age: 70

Average healthy cells: 22

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

Person 5

Age: 85

Average healthy cells: 21

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

Person 6

Age: 100

Average healthy cells: 22

HM HM HM YS HM

HM HM YS YS HM

HM HM HM HM HM

HM YS MW HM HM

HM HM DM DM HM

Person 7

Age: 60

Average healthy cells: 23

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

HM HM HM HM HM

Person 8

Age: 62

Average healthy cells: 22

HM HM HM HM HM

HM HM HM HM HM

HM YS HM HM HM

YS YS YS HM HM

HM HM HM HM HM

Person 9

Age: 75

Average healthy cells: 20

HM HM HM HM HM

HM YS HM HM HM

YS YS HM HM HM

YS HM HM HM HM

HM HM HM HM HM

Person 10

Age: 60

Average healthy cells: 20

HM HM HM YS YS

HM HM HM HM YS

HM HM HM HM HM

HM HM YS HM HM

MW DM HM DM DM

Process finished with exit code 0