RUBY: Module 02: Task 01: Class Design: Diagram

Classes

BioCatalogue

Acts as a catalogue for all the organisms, allowing methods to be run on the facility and the results to be observed

AVAILABLE_TREATMENTS[]
Constant array of symbols representing treatments available

@organism_list[]
Array containing all the organism objects in our catalogue

get_lethal_organisms(int)
*Partition method to filter only organisms over a certain lethality index **(int)***

add_plasmid()
Map method to loop over our organisms and return a new list containing a plasmid-containing organism

get_cost_of_treatment(int)
*Reduce method to total the cost of treating all organisms based on number of infected patients **(int)***

get_organisms_resistant_to(:treatment)
Select method to find organisms resistant to a specific treatment

get_viruses()
Select method to find only viruses

get_bacteria()
Select method to find only bacteria

diagnose([:symptoms])
Select method to find possibly causes based on symptoms

Organism (Base Class)

Contains generic methods for describing and manipulating the object

Unique Attributes:

@size
*Size of the organism **(int)***

@is_cell?
*Is this organism a cell **(boolean)***

@symptoms[]
*Array of symbols representing symptoms of infection **([:symbol])***

@cost_of_treatment
*Cost of curing the infection in 1 person **(int)***

@lethality
*On a scale of 1-10 with 10 being 100% mortality, how lethal is this organism **(int)***

Unique Methods:

@to_s()
Display information about this organism

@treat?(:treatment)
Test the treatment to see if the organism is resistant to it and return true or false

Bacteria < Organism

Set Inherited Attributes:

@size = 1000
@ls_cell? = true

Unique Attributes:

@resistant_to[]
*Array of treatment symbols that the organism is resistant to **([:treatment])***

@gram_negative?
*Is this organism gram negative? **(boolean)***

@shape?
What shape is the organism? ***(:shape)***

GramNegativeBacteria < Bacteria

Set Inherited Attributes:

@gram_negative? = true
@resistant_to = [Vancomycin, Streptomycin]

Unique Attributes:

@lps_type
Symbol representing the LPS type for this organism

EscherichiaColi < GramNegativeBacteria

Unique Attributes:

@shape = rod
@resistant_to = [Tetracycline]
@lps_type = A
@symptoms = [diarrhea, abdominal pain, fever, vomiting]

EscherichiaColiO157 < EscherichiaColi

Unique Attributes:

@shape = rod
@resistant_to = [Tetracycline]
@lps_type = A
@symptoms = [Shiga toxin]

Unique Methods:

produce_shiga_toxin()
Method which adds shiga toxin to the symptoms array

VibrioCholerae < GramNegativeBacteria

Unique Attributes:

@shape = comma
@resistant_to = [Gentamicin]
@lps_type = C
@symptoms = [diarrhea, vomiting]

Unique Methods:

flagellar_movement()
Method which enables to bacteria to “swim”

VibrioCholeraeO139 < VibrioCholerae

Unique Attributes:

@symptoms = [cholera]

Unique Methods:

cause_cholera()
Method which adds cholera to the list of symptoms

YersiniaPestis < GramNegativeBacteria

Unique Attributes:

@shape = rod
@resistant_to = [Penicillin]
@lps_type = B
@symptoms = [high fever, chills, headaches, bloody cough]

Unique Methods:

cause_plague()
Method which adds plague symptoms to array

YersiniaPestis (+ResistancePlasmid) < YersiniaPestis

Unique Attributes:

@resistant_to = [Methicillin, Gentamicin, Tetracycline]

Unique Methods:

resist_methicillin(), resist_gentamycin(), resist_tetracycline()
Methods which add resistances to array

GramPositiveBacteria < Bacteria

Set Inherited Attributes:

@gram_negative? = false
@resistant_to = [Chloramphenicol, Tetracycline]

Unique Attributes:

@teichoic_acid_type
Symbol representing the Teichoic Acid type for this organism

StaphylococcusAureus < GramPositiveBacteria

Unique Attributes:

@shape = round
@resistant_to = [Penicillin]
@teichoic_acid_type = 6
@symptoms = [abscesses, respiratory infections, food poisoning]

Unique Methods:

infect_cut()
Method which adds abscesses to array

StaphylococcusAureusMRSA < StaphylococcusAureus

Unique Attributes:

@shape = round
@resistant_to = [all antibiotics]
@symptoms = [sores, boils]

Unique Methods:

resist_all_antibiotics()
Method which adds all treatments to resistant_to array

StreptococcusPneumoniae < GramPositiveBacteria

Unique Attributes:

@shape = round

@resistant_to = [Penicillin]
@teichoic_acid_type = 3
@symptoms = [pneumonia, meningitis]

Unique Methods:

infect_immuno_compromised_patient()
Method which just outputs string

ClostridiumBotulinum < GramPositiveBacteria

Unique Attributes:

@shape = round
@resistant_to = [Amoxicillin]
@teichoic_acid_type = 7
@symptoms = [paralysis]

Unique Methods:

paralyse_animal()
Method which just outputs string

ClostridiumBotulinumTypeB < ClostridiumBotulinum

Unique Methods:

paralyse_human()
Method which just outputs string

Virus < Organism

Set Inherited Attributes:

@size = 300
@ls_cell? = false

Unique Attributes:

@rna_or_dna?
*Is this an RNA or DNA virus **(:symbol)***

@single_strand?
*Is this organism's nucleic acid single stranded? **(boolean)***

Ebola < Virus

Unique Attributes:

@rna_or_dna = rna
@single_strand = true
@symptoms = [fever, headache, joint and muscle aches, sore throat]

Unique Methods:

explode_cell()
Method which just outputs string

HIV < Virus

Unique Attributes:

@rna_or_dna = rna
@single_strand = true
@symptoms = [swelling of lymph nodes, weakness]

Unique Methods:

destroy_immune_system()
Method which just outputs string

Smallpox < Virus

Unique Attributes:

@rna_or_dna = dna
@single_strand = false
@symptoms = [high fever, flu-like symptoms, pus-filled sores]

Unique Methods:

produce_sores()
Method which adds pus-filled sores to symptoms array

Modules

MethicillinPlasmid

Unique Methods:

resist_methicillin()

Method which adds Methicillin to resistant_to array