Министерство науки и образования РФ

Федеральное государственное бюджетное учреждение

высшего образования

**«Тверской государственный технический университет»**

(ТвГТУ)

Кафедра программного обеспечения

**Отчет по лабораторной работе №5**

по дисциплине: ***«Интеллектуальные информационные системы»***

Тема: ***«Задача о миссионерах и каннибалах»***

Выполнил:

Студент группы

Б.ПИН.РИС – 18.06.

Кондратьев М.А.

Проверил:

Мальков А.А.

# Цель

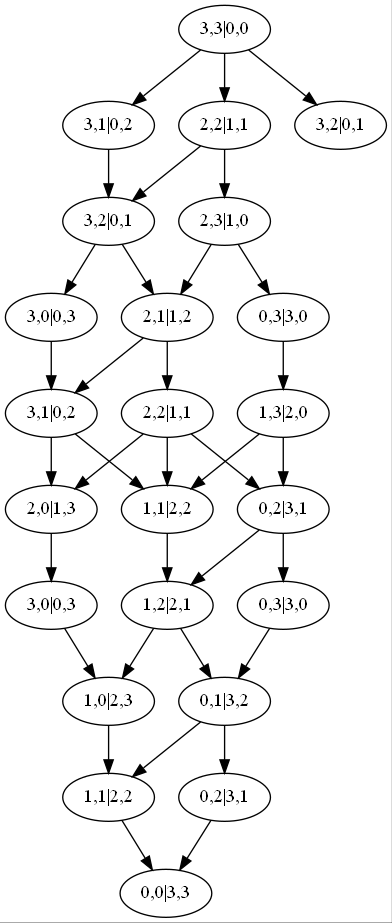
Закрепить понимание методов поиска решений в пространстве состояний. Разработать информационная систему по задаче “Миссионеры и каннибалы”.

Постановка задачи: три миссионера и три каннибала на одном берегу. Нужно переправить на другой берег используя двух местную лодку. Лодка не может плыть пустой, а также нельзя оставлять на берегу больше каннибалов чем миссионеров.

# Дерево поиска задачи

Пояснение: a,b | c,d

1. Число миссионеров на начальном берегу
2. Число каннибалов на начальном берегу
3. Число миссионеров на конечном берегу
4. Число каннибалов на конечном берегу



# Основной модуль

Содержит основную структуру задачи, а также правила

* Шаблон состояния (status)

(deftemplate MAIN::status

(slot shore-1-miss (type INTEGER) (range 0 ?VARIABLE))

(slot shore-1-cann (type INTEGER) (range 0 ?VARIABLE))

(slot shore-2-miss (type INTEGER) (range 0 ?VARIABLE))

(slot shore-2-cann (type INTEGER) (range 0 ?VARIABLE))

(slot boat-location (type SYMBOL) (allowed-values shore-1 shore-2))

(slot search-depth (type INTEGER) (range 1 ?VARIABLE))

(slot parent (type FACT-ADDRESS SYMBOL) (allowed-symbols no-parent))

(slot last-move (type STRING))

)

* Глобальные переменные начальных значений миссионеров и каннибалов

(defglobal MAIN

?\*initial-missionaries\* = 3

?\*initial-cannibals\* = 3

)

* Исходное состояния задачи

(deffacts MAIN::initial-positions

(status

(shore-1-miss ?\*initial-missionaries\*)

(shore-1-cann ?\*initial-cannibals\*)

(shore-2-miss 0)

(shore-2-cann 0)

(boat-location shore-1)

(search-depth 1)

(parent no-parent)

(last-move "No move.")

)

)

* Вместимость лодки

(deffacts MAIN::boat-information

(boat-can-hold 2)

)

* Функция для более удобного вывода шагов

(deffunction MAIN::move-string (?miss ?cann ?shore)

(switch ?miss

(case 0 then

(if (eq ?cann 1)

then (format nil "Move 1 cannibal to %s.%n" ?shore)

else (format nil "Move %d cannibals to %s.%n" ?cann ?shore)))

(case 1 then

(switch ?cann

(case 0 then

(format nil "Move 1 missionary to %s.%n" ?shore))

(case 1 then

(format nil "Move 1 missionary and 1 cannibal to %s.%n" ?shore))

(default then

(format nil "Move 1 missionary and %d cannibals to %s.%n"

?cann ?shore))))

(default

(switch ?cann

(case 0 then

(format nil "Move %d missionaries to %s.%n" ?miss ?shore))

(case 1 then

(format nil "Move %d missionaries and 1 cannibal to %s.%n" ?miss ?shore))

(default then

(format nil "Move %d missionary and %d cannibals to %s.%n" ?miss ?cann ?shore))))))

* Основные правила задачи

; Правила движения с начального острова

(defrule MAIN::shore-1-move

?node <- (status

(shore-1-miss ?s1m)

(shore-1-cann ?s1c)

(shore-2-miss ?s2m)

(shore-2-cann ?s2c)

(boat-location shore-1)

(search-depth ?sd)

)

(boat-can-hold ?limit)

=>

(bind ?max-miss (min ?s1m ?limit))

(loop-for-count (?miss 0 ?max-miss)

(bind ?min-cann (max 0 (- 1 ?miss)))

(bind ?max-cann (min ?s1c (- ?limit ?miss)))

(loop-for-count (?cann ?min-cann ?max-cann)

(duplicate ?node

(shore-1-miss (- ?s1m ?miss))

(shore-1-cann (- ?s1c ?cann))

(shore-2-miss (+ ?s2m ?miss))

(shore-2-cann (+ ?s2c ?cann))

(boat-location shore-2)

(search-depth (+ ?sd 1))

(parent ?node)

(last-move (move-string ?miss ?cann shore-2))

)

)

)

)

; Правила движения с конечного острова

(defrule MAIN::shore-2-move

?node <- (status

(shore-1-miss ?s1m)

(shore-1-cann ?s1c)

(shore-2-miss ?s2m)

(shore-2-cann ?s2c)

(boat-location shore-2)

(search-depth ?sd)

)

(boat-can-hold ?limit)

=>

(bind ?max-miss (min ?s2m ?limit))

(loop-for-count (?miss 0 ?max-miss)

(bind ?min-cann (max 0 (- 1 ?miss)))

(bind ?max-cann (min ?s2c (- ?limit ?miss)))

(loop-for-count (?cann ?min-cann ?max-cann)

(duplicate ?node

(shore-1-miss (+ ?s1m ?miss))

(shore-1-cann (+ ?s1c ?cann))

(shore-2-miss (- ?s2m ?miss))

(shore-2-cann (- ?s2c ?cann))

(boat-location shore-1)

(search-depth (+ ?sd 1))

(parent ?node)

(last-move (move-string ?miss ?cann shore-1))

)

)

)

)

# Модуль ограничений

Отвечает за применение оганичений задачи к системе

* Импорт шаблона status

(defmodule CONSTRAINTS

(import MAIN deftemplate status)

)

* Ограничение поедания миссионеров

(defrule CONSTRAINTS::fail-shore-1

(declare (auto-focus TRUE))

?node <- (status

(boat-location shore-2)

(shore-1-miss ?m)

(shore-1-cann ?c)

)

(test (< ?m ?c))

(test (> ?m 0))

=> (retract ?node)

)

;Миссионеров съели на втором берегу

(defrule CONSTRAINTS::fail-shore-2

(declare (auto-focus TRUE))

?node <- (status

(boat-location shore-1)

(shore-2-miss ?m)

(shore-2-cann ?c)

)

(test (< ?m ?c))

(test (> ?m 0))

=> (retract ?node)

)

* Ограничение зацикливания

;Недопустить путь который уже был найден но с более длинным путём

(defrule CONSTRAINTS::circular-path

(declare (auto-focus TRUE))

(status

(shore-1-miss ?s1m)

(shore-1-cann ?s1c)

(shore-2-miss ?s2m)

(shore-2-cann ?s2c)

(boat-location ?s)

(search-depth ?sd1)

)

?node <- (status

(shore-1-miss ?s1m)

(shore-1-cann ?s1c)

(shore-2-miss ?s2m)

(shore-2-cann ?s2c)

(boat-location ?s)

(search-depth ?sd2 & :(> ?sd2 ?sd1))

)

=> (retract ?node)

)

# Модуль вывода

* Импорт шаблона status

(defmodule SOLUTION

(import MAIN deftemplate status)

)

* Шаблон moves

; Шаблон движений

(deftemplate SOLUTION::moves

(slot id (type FACT-ADDRESS SYMBOL) (allowed-symbols no-parent))

(multislot moves-list (type STRING))

)

* Распознавание верного состояния

; Найти правильный ответ

(defrule SOLUTION::goal-test

(declare (auto-focus TRUE))

?node <- (status

(shore-1-miss 0)

(shore-1-cann 0)

(shore-2-miss 3)

(shore-2-cann 3)

(boat-location shore-2)

(parent ?parent)

(last-move ?move)

)

=>

(retract ?node)

(assert (moves (id ?parent) (moves-list ?move)))

)

* Построение решения

; Построить ответ

(defrule SOLUTION::build-solution

?node <- (status

(parent ?parent)

(last-move ?move)

)

?mv <- (moves (id ?node) (moves-list $?rest))

=>

(modify ?mv (id ?parent) (moves-list ?move ?rest))

)

* Вывод решения на экран

; Вывести ответ

(defrule SOLUTION::print-solution

?mv <- (moves (id no-parent) (moves-list "No move." $?m))

=>

(retract ?mv)

(printout t t "Solution found: " t t)

(progn$ (?move ?m) (printout t ?move))

)

# Процесс выполнения

В процессе выполнения в модуле MAIN генерируются новые факты (состояния задачи). Некоторые из них отсеиваются модулем CONSTRAINS. Если было найдено целевое состояние то его обрабатывает модуль SOLUTION.

Вывод программы:

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 2 missionaries to shore-2.

Move 2 cannibals to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 2 missionaries to shore-2.

Move 2 cannibals to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 2 missionaries to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 2 missionaries to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 2 missionaries to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 2 missionaries to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 missionaries to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 missionaries to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 missionaries to shore-2.

Move 1 missionary to shore-1.

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 missionaries to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 missionaries to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Move 1 missionary to shore-1.

Move 2 missionaries to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 2 missionaries to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 2 missionaries to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 2 missionaries to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 2 missionaries to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 missionaries to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 missionaries to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 missionaries to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 missionaries to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 missionaries to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 missionaries to shore-2.

Move 1 missionary to shore-1.

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 missionaries to shore-2.

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Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 missionaries to shore-2.

Move 1 missionary to shore-1.

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

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Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

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Move 1 cannibal to shore-1.

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Move 1 cannibal to shore-1.

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Move 1 cannibal to shore-1.

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Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

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Move 2 missionaries to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 2 missionaries to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

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Move 1 missionary to shore-1.

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Move 1 missionary and 1 cannibal to shore-2.

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Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

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Move 2 missionaries to shore-2.

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Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 2 missionaries to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

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Solution found:

Move 1 missionary and 1 cannibal to shore-2.

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Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Move 1 missionary to shore-1.

Move 2 missionaries to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 2 missionaries to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 2 missionaries to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Solution found:

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 2 missionaries to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 2 missionaries to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 missionaries to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 missionaries to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Solution found:

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 missionaries to shore-2.

Move 1 missionary to shore-1.

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 missionaries to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 missionaries to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Solution found:

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Solution found:

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Move 1 missionary to shore-1.

Move 2 missionaries to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 2 missionaries to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 2 missionaries to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Solution found:

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 2 missionaries to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Solution found:

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 2 cannibals to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

Move 1 missionary to shore-1.

Move 2 missionaries to shore-2.

Move 1 cannibal to shore-1.

Move 1 missionary and 1 cannibal to shore-2.

# Заключение

Было закреплено понимание методов поиска решений в пространстве состояния на примере задачи “Миссионеры и каннибалы”.