

# Programming Exercises

## Project Presentation

Marcus Vinicius Pereira Araujo 1106149

Purit Thong-On 1106398

Piyaphat Russamitinakornkul 1106291

Frankfurt University of Applied Sciences

July 23, 2015



# Table of contents

- 1 UVa Online Judge
  - Marcus' UVa Online Judge
  - Purit's UVa Online Judge
  - Piyaphat's UVa Online Judge
  - Programming Day
- 2 Kakuro Solver
  - Project Requirement
  - Problem Description
  - Genetic Algorithms
  - Kakuro Algorithm Implementation
  - Kakuro Implementation Problems
  - Kakuro Solutions



# Section 1

UVa Online Judge



# UVa Online Judge

Group Members:

- ① Marcus Vinicius Pereira Araujo
- ② Purit Thong-On
- ③ Piyaphat Russamitinakornkul

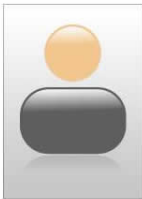


## Marcus' UVa Online Judge



# UVa Online Judge - Marcus

Marcus\_Vinicius Profile Page



Hits:	0
Online Status:	 ONLINE
Member Since:	3 months ago
Last Online:	7 minutes ago

### Contact Info

Marcus_Vinicius	
Online Judge ID:	734863
Results email:	Yes
Virtual Judge:	No



# UVa Online Judge - Marcus

## Solved problems

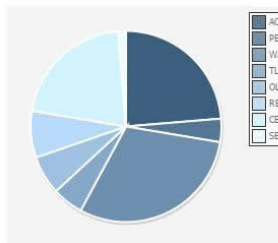
Problem	Ranking	Submission	Date	Run time
412	1641	15470976	2015-05-12 16:12:17	0.212
534	1543	15447642	2015-05-07 20:12:53	0.063
543	1908	15410848	2015-04-30 14:27:48	0.095
576	2533	15470078	2015-05-12 13:44:55	0.009
960	95	15469850	2015-05-12 13:00:36	0.012
10104	956	15482869	2015-05-14 23:24:15	0.149
10235	1619	15482802	2015-05-14 22:43:56	0.032
10341	1920	15432324	2015-05-04 18:15:06	0.042
10566	1154	15398820	2015-04-28 14:18:09	0.025
10783	16568	15398233	2015-04-28 12:26:54	0.032
10929	3140	15485875	2015-05-15 12:06:06	0.032
11172	10428	15411875	2015-04-30 18:15:25	0.009
11346	107	15465341	2015-05-11 15:34:59	0.009
11677	3358	15395551	2015-04-27 22:21:19	0.016
11879	1725	15487612	2015-05-15 17:25:27	0.019
12250	1091	15412354	2015-04-30 19:39:15	0.009
12502	1501	15412708	2015-04-30 21:03:26	0.015



# UVa Online Judge - Marcus

76

SUBMISSIONS



17

PROBLEMS TRIED

17

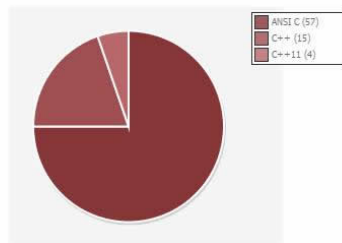
PROBLEMS SOLVED

2015-04-21

FIRST SUBMISSION

2015-05-16

LAST SUBMISSION





# UVa Online Judge - Marcus

## My Submissions

#	Problem	Verdict	Language	Run Time	Submission Date
15493762	534 Frogger	Accepted	C++	0.068	2015-05-16 20:59:36
15487612	11879 Multiple of 17	Accepted	ANSI C	0.019	2015-05-15 17:25:27
15487600	11879 Multiple of 17	Runtime error	ANSI C	0.000	2015-05-15 17:23:53
15487589	11879 Multiple of 17	Runtime error	ANSI C	0.000	2015-05-15 17:21:38
15485875	10929 You can say 11	Accepted	ANSI C	0.032	2015-05-15 12:06:06
15485854	10929 You can say 11	Wrong answer	ANSI C	0.022	2015-05-15 12:03:41
15485817	10929 You can say 11	Wrong answer	ANSI C	0.015	2015-05-15 11:58:27
15485795	10929 You can say 11	Wrong answer	ANSI C	0.025	2015-05-15 11:55:25
15485782	10929 You can say 11	Compilation error	ANSI C	0.000	2015-05-15 11:52:52
15485699	10929 You can say 11	Output limit exceeded	ANSI C	3.969	2015-05-15 11:35:28
15483244	10929 You can say 11	Wrong answer	ANSI C	0.029	2015-05-15 01:57:57
15483183	10929 You can say 11	Wrong answer	ANSI C	0.025	2015-05-15 01:37:51
15482869	10104 Euclid Problem	Accepted	ANSI C	0.149	2015-05-14 23:24:15
15482802	10235 Simply Emirp	Accepted	ANSI C	0.032	2015-05-14 22:43:56
15482800	10235 Simply Emirp	Compilation error	C++	0.000	2015-05-14 22:43:19
15482787	10235 Simply Emirp	Time limit exceeded	ANSI C	3.000	2015-05-14 22:37:57
15482780	10235 Simply Emirp	Time limit exceeded	ANSI C	3.000	2015-05-14 22:36:11
15482775	10235 Simply Emirp	Compilation error	ANSI C	0.000	2015-05-14 22:34:28
15470976	412 Pi	Accepted	ANSI C	0.212	2015-05-12 16:12:17
15470960	412 Pi	Runtime error	ANSI C	0.000	2015-05-12 16:08:59
15470911	412 Pi	Wrong answer	ANSI C	0.012	2015-05-12 16:00:12
15470891	412 Pi	Wrong answer	ANSI C	0.009	2015-05-12 15:57:12
15470856	412 Pi	Wrong answer	ANSI C	0.012	2015-05-12 15:52:32
15470843	412 Pi	Wrong answer	ANSI C	0.016	2015-05-12 15:51:01
15470836	412 Pi	Compilation error	ANSI C	0.000	2015-05-12 15:50:14
15470668	412 Pi	Compilation error	ANSI C	0.000	2015-05-12 15:25:47
15470078	576 Haiku Review	Accepted	ANSI C	0.009	2015-05-12 13:44:55
15469850	960 Gaussian Primes	Accepted	C++	0.012	2015-05-12 13:00:36
15469846	960 Gaussian Primes	Compilation error	C++	0.000	2015-05-12 12:59:49
15469786	960 Gaussian Primes	Time limit exceeded	C++	3.000	2015-05-12 12:50:53



# UVa Online Judge - Marcus

## My Submissions

#	Problem	Verdict	Language	Run Time	Submission Date
15469733	960 Gaussian Primes	Submission error	ANSI C	0.000	2015-05-12 12:38:04
15469732	960 Gaussian Primes	Time limit exceeded	ANSI C	3.000	2015-05-12 12:38:04
15469726	576 Haiku Review	Compilation error	ANSI C	0.000	2015-05-12 12:36:53
15469671	576 Haiku Review	Compilation error	ANSI C	0.000	2015-05-12 12:26:25
15468957	576 Haiku Review	Compilation error	ANSI C	0.000	2015-05-12 09:58:16
15465341	11346 Probability	Accepted	ANSI C	0.009	2015-05-11 15:34:59
15455978	576 Haiku Review	Wrong answer	ANSI C	0.019	2015-05-09 14:13:49
15447642	534 Frogger	Accepted	C++	0.063	2015-05-07 20:12:53
15447626	534 Frogger	Output limit exceeded	C++11	4.015	2015-05-07 20:09:25
15447607	534 Frogger	Output limit exceeded	C++	4.005	2015-05-07 20:03:25
15446249	534 Frogger	Compilation error	C++	0.000	2015-05-07 14:38:48
15432324	10341 Solve It	Accepted	C++	0.042	2015-05-04 18:15:06
15431994	10341 Solve It	Runtime error	ANSI C	0.000	2015-05-04 16:51:30
15412708	12502 Three Families	Accepted	ANSI C	0.015	2015-04-30 21:03:26
15412698	12502 Three Families	Wrong answer	ANSI C	0.012	2015-04-30 21:00:45
15412687	12502 Three Families	Wrong answer	ANSI C	0.015	2015-04-30 20:57:12
15412354	12250 Language Detection	Accepted	C++	0.009	2015-04-30 19:39:15
15412301	12250 Language Detection	Wrong answer	ANSI C	0.012	2015-04-30 19:26:38
15412294	12250 Language Detection	Compilation error	ANSI C	0.000	2015-04-30 19:24:58
15412259	12250 Language Detection	Compilation error	ANSI C	0.000	2015-04-30 19:19:58
15412215	12250 Language Detection	Runtime error	ANSI C	0.000	2015-04-30 19:12:09
15412196	12250 Language Detection	Runtime error	ANSI C	0.000	2015-04-30 19:09:52
15411875	11172 Relational Operator	Accepted	C++	0.009	2015-04-30 18:15:25
15411867	11172 Relational Operator	Wrong answer	ANSI C	0.009	2015-04-30 18:13:12
15411842	11172 Relational Operator	Wrong answer	ANSI C	0.009	2015-04-30 18:09:16
15411832	11172 Relational Operator	Wrong answer	ANSI C	0.009	2015-04-30 18:07:36
15411817	11172 Relational Operator	Wrong answer	ANSI C	0.012	2015-04-30 18:03:51
15411808	11172 Relational Operator	Presentation error	ANSI C	0.009	2015-04-30 18:02:33
15411772	11172 Relational Operator	Compilation error	ANSI C	0.000	2015-04-30 17:55:36
15410848	543 Goldbach's Conjecture	Accepted	C++	0.095	2015-04-30 14:27:48

&lt;&lt; Start &lt; Prev 1 2 3 Next &gt; End &gt;&gt;



# UVa Online Judge - Marcus

## My Submissions

#	Problem	Verdict	Language	Run Time	Submission Date
15410032	11172 Relational Operator	Presentation error	ANSI C	0.022	2015-04-30 11:40:52
15399187	534 Frogger	Output limit exceeded	ANSI C	3.972	2015-04-28 15:21:33
15399153	534 Frogger	Output limit exceeded	ANSI C	3.969	2015-04-28 15:18:08
15398820	10566 Crossed Ladders	Accepted	C++	0.025	2015-04-28 14:18:09
15398233	10783 Odd Sum	Accepted	ANSI C	0.032	2015-04-28 12:26:54
15395678	10783 Odd Sum	Wrong answer	ANSI C	0.015	2015-04-27 23:40:54
15395551	11677 Alarm Clock	Accepted	ANSI C	0.016	2015-04-27 22:21:19
15395547	11677 Alarm Clock	Compilation error	ANSI C	0.000	2015-04-27 22:20:09
15395542	11677 Alarm Clock	Compilation error	ANSI C	0.000	2015-04-27 22:18:17
15394222	11677 Alarm Clock	Wrong answer	ANSI C	0.019	2015-04-27 16:43:51
15393797	11677 Alarm Clock	Wrong answer	ANSI C	0.012	2015-04-27 15:27:41
15393795	11677 Alarm Clock	Wrong answer	C++	0.022	2015-04-27 15:27:18
15393764	11677 Alarm Clock	Wrong answer	C++11	0.022	2015-04-27 15:22:30
15393627	10783 Odd Sum	Wrong answer	C++11	0.022	2015-04-27 14:57:48
15361020	11172 Relational Operator	Presentation error	C++11	0.036	2015-04-21 12:22:32
15360802	11172 Relational Operator	Compilation error	C++	0.000	2015-04-21 11:23:46
<< Start < Prev 1 2 3 Next > End >>					



## Subsection 2

Purit's UVa Online Judge



# UVa Online Judge - Purit

## purit2006 Profile Page



Hits:	0
Online Status:	🟢 ONLINE
Member Since:	2 years ago
Last Online:	22 seconds ago
Last Updated:	2 months ago

### Contact Info

purit2006

**Online Judge ID:** 286275**Results email:** Yes**Virtual Judge:** No

# UVa Online Judge - Purit

## Solved problems

Problem	Ranking	Submission	Date	Run time
378	2574	12078925	2013-07-21 03:10:55	0.016
382	11010	15469859	2015-05-12 13:01:59	0.239
960	147	15469054	2015-05-12 10:15:20	0.232
10235	5714	15469647	2015-05-12 12:23:38	1.116
10340	7828	12073884	2013-07-20 03:22:56	0.022
10341	3847	15435401	2015-05-05 13:00:13	1.312
10783	17343	15393500	2015-04-27 14:36:41	0.225
10929	6764	15504930	2015-05-19 09:06:24	0.712
11172	21407	15360773	2015-04-21 11:15:50	0.199
11561	631	15505995	2015-05-19 13:37:30	0.208
11677	3928	15361644	2015-04-21 14:22:47	0.252
12250	4470	15361052	2015-04-21 12:29:49	0.488
12502	2108	15361337	2015-04-21 13:24:44	0.238
12854	488	15603004	2015-06-09 10:47:18	0.244
12894	232	15603379	2015-06-09 11:55:59	0.299
12895	7	15603224	2015-06-09 11:30:42	0.000
12896	35	15603054	2015-06-09 10:59:39	0.002



# UVa Online Judge - Purit

**111**

SUBMISSIONS

**24**

PROBLEMS TRIED

**17**

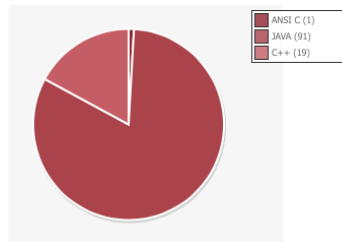
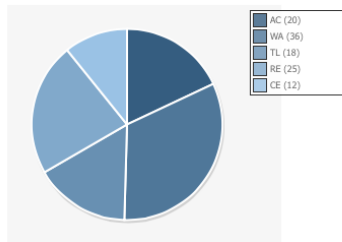
PROBLEMS SOLVED

**2013-07-13**

FIRST SUBMISSION

**2015-06-09**

LAST SUBMISSION



# UVa Online Judge - Purit

## My Submissions

#	Problem	Verdict	Language	Run Time	Submission Date
15604093	12908 The book thief	Time limit exceeded	JAVA	1.000	2015-06-09 14:03:21
15603849	12908 The book thief	Time limit exceeded	ANSI C	1.000	2015-06-09 13:20:16
15603818	12908 The book thief	Time limit exceeded	C++	1.000	2015-06-09 13:14:49
15603759	12908 The book thief	Time limit exceeded	JAVA	1.000	2015-06-09 13:05:32
15603379	12894 Perfect Flag	Accepted	JAVA	0.299	2015-06-09 11:55:59
15603224	12895 Armstrong Number	Accepted	C++	0.000	2015-06-09 11:30:42
15603191	12861 Help cupid	Wrong answer	JAVA	0.865	2015-06-09 11:25:01
15603054	12896 Mobile SMS	Accepted	C++	0.002	2015-06-09 10:59:39
15603004	12854 Automated Checking Machine	Accepted	JAVA	0.244	2015-06-09 10:47:18
15602990	12854 Automated Checking Machine	Runtime error	JAVA	0.000	2015-06-09 10:45:04
15602987	12854 Automated Checking Machine	Runtime error	JAVA	0.000	2015-06-09 10:43:42
15602935	12854 Automated Checking Machine	Compilation error	JAVA	0.000	2015-06-09 10:33:11
15602914	12854 Automated Checking Machine	Runtime error	JAVA	0.000	2015-06-09 10:28:41
15602906	12854 Automated Checking Machine	Compilation error	JAVA	0.000	2015-06-09 10:26:00
15505995	11561 Getting Gold	Accepted	JAVA	0.208	2015-05-19 13:37:30
15505988	11561 Getting Gold	Accepted	JAVA	0.209	2015-05-19 13:36:02
15505980	11561 Getting Gold	Accepted	JAVA	0.229	2015-05-19 13:34:22
15505911	11561 Getting Gold	Runtime error	JAVA	0.000	2015-05-19 13:15:24
15505896	11561 Getting Gold	Runtime error	JAVA	0.000	2015-05-19 13:12:19
15505834	11561 Getting Gold	Runtime error	JAVA	0.000	2015-05-19 12:57:05
15505727	11561 Getting Gold	Runtime error	JAVA	0.000	2015-05-19 12:25:02
15505724	11561 Getting Gold	Accepted	JAVA	0.239	2015-05-19 12:24:22
15505703	11561 Getting Gold	Runtime error	JAVA	0.000	2015-05-19 12:18:19
15505462	11561 Getting Gold	Runtime error	JAVA	0.000	2015-05-19 11:17:21
15504960	412 Pi	Wrong answer	JAVA	1.515	2015-05-19 09:13:32
15504930	10929 You can say 11	Accepted	JAVA	0.712	2015-05-19 09:06:24
15504899	10929 You can say 11	Wrong answer	JAVA	1.575	2015-05-19 09:01:33
15504832	10929 You can say 11	Wrong answer	JAVA	1.516	2015-05-19 08:48:57
15476081	412 Pi	Wrong answer	JAVA	2.335	2015-05-13 14:54:19
15475813	412 Pi	Wrong answer	JAVA	1.282	2015-05-13 14:10:02

&lt;&lt; Start &lt; Prev 1 2 3 4 Next &gt; End &gt;&gt;





# UVa Online Judge - Purit

## My Submissions

#	Problem	Verdict	Language	Run Time	Submission Date
15475803	<a href="#">412 Pi</a>	Wrong answer	JAVA	1.155	2015-05-13 14:08:07
15475792	<a href="#">412 Pi</a>	Wrong answer	JAVA	1.106	2015-05-13 14:04:13
15475778	<a href="#">412 Pi</a>	Wrong answer	JAVA	1.069	2015-05-13 14:01:33
15475760	<a href="#">412 Pi</a>	Wrong answer	JAVA	1.092	2015-05-13 13:58:46
15475715	<a href="#">412 Pi</a>	Time limit exceeded	JAVA	3.000	2015-05-13 13:49:01
15470102	<a href="#">11063 B2-Sequence</a>	Runtime error	JAVA	0.000	2015-05-12 13:51:15
15470090	<a href="#">11063 B2-Sequence</a>	Runtime error	JAVA	0.000	2015-05-12 13:47:28
15470064	<a href="#">11063 B2-Sequence</a>	Runtime error	JAVA	0.000	2015-05-12 13:42:12
15470054	<a href="#">11063 B2-Sequence</a>	Runtime error	JAVA	0.000	2015-05-12 13:39:51
15470047	<a href="#">11063 B2-Sequence</a>	Runtime error	JAVA	0.000	2015-05-12 13:38:20
15469859	<a href="#">382 Perfection</a>	Accepted	JAVA	0.239	2015-05-12 13:01:59
15469851	<a href="#">10235 Simply Emirp</a>	Runtime error	JAVA	0.000	2015-05-12 13:00:45
15469647	<a href="#">10235 Simply Emirp</a>	Accepted	JAVA	1.116	2015-05-12 12:23:38
15469343	<a href="#">10235 Simply Emirp</a>	Wrong answer	JAVA	1.039	2015-05-12 11:17:42
15469324	<a href="#">10235 Simply Emirp</a>	Wrong answer	JAVA	1.112	2015-05-12 11:13:18
15469311	<a href="#">10235 Simply Emirp</a>	Wrong answer	JAVA	1.025	2015-05-12 11:09:28
15469299	<a href="#">10235 Simply Emirp</a>	Wrong answer	JAVA	1.059	2015-05-12 11:04:43
15469166	<a href="#">543 Goldbach's Conjecture</a>	Time limit exceeded	JAVA	3.000	2015-05-12 10:37:07
15469131	<a href="#">543 Goldbach's Conjecture</a>	Time limit exceeded	JAVA	3.000	2015-05-12 10:29:48
15469106	<a href="#">543 Goldbach's Conjecture</a>	Time limit exceeded	JAVA	3.000	2015-05-12 10:22:11
15469054	<a href="#">960 Gaussian Primes</a>	Accepted	JAVA	0.232	2015-05-12 10:15:20
15468937	<a href="#">543 Goldbach's Conjecture</a>	Time limit exceeded	JAVA	3.000	2015-05-12 09:54:56
15465454	<a href="#">543 Goldbach's Conjecture</a>	Time limit exceeded	JAVA	3.000	2015-05-11 15:51:16
15465450	<a href="#">543 Goldbach's Conjecture</a>	Compilation error	JAVA	0.000	2015-05-11 15:50:32
15465438	<a href="#">543 Goldbach's Conjecture</a>	Time limit exceeded	JAVA	3.000	2015-05-11 15:48:14
15465377	<a href="#">543 Goldbach's Conjecture</a>	Runtime error	JAVA	0.000	2015-05-11 15:40:08
15465339	<a href="#">543 Goldbach's Conjecture</a>	Time limit exceeded	JAVA	3.000	2015-05-11 15:34:51
15465312	<a href="#">543 Goldbach's Conjecture</a>	Compilation error	JAVA	0.000	2015-05-11 15:32:18
15465253	<a href="#">543 Goldbach's Conjecture</a>	Runtime error	JAVA	0.000	2015-05-11 15:22:47
15465230	<a href="#">543 Goldbach's Conjecture</a>	Time limit exceeded	JAVA	3.000	2015-05-11 15:19:57

&lt;&lt; Start &lt; Prev 1 2 3 4 Next &gt; End &gt;&gt;



# UVa Online Judge - Purit

## My Submissions

#	Problem	Verdict	Language	Run Time	Submission Date
15465144	543 Goldbach's Conjecture	Time limit exceeded	JAVA	3.000	2015-05-11 15:07:42
15435401	10341 Solve It	Accepted	JAVA	1.312	2015-05-05 13:00:13
15435394	10341 Solve It	Wrong answer	JAVA	1.132	2015-05-05 12:58:58
15435387	10341 Solve It	Runtime error	JAVA	0.000	2015-05-05 12:57:33
15435353	10341 Solve It	Runtime error	JAVA	0.000	2015-05-05 12:48:47
15435340	10341 Solve It	Runtime error	JAVA	0.000	2015-05-05 12:46:10
15435327	10341 Solve It	Compilation error	JAVA	0.000	2015-05-05 12:44:04
15434759	10282 Babelfish	Runtime error	JAVA	0.000	2015-05-05 10:12:56
15434757	10282 Babelfish	Runtime error	JAVA	0.000	2015-05-05 10:12:26
15434753	10282 Babelfish	Compilation error	JAVA	0.000	2015-05-05 10:10:37
15434742	10282 Babelfish	Runtime error	JAVA	0.000	2015-05-05 10:09:29
15393500	10783 Odd Sum	Accepted	JAVA	0.225	2015-04-27 14:36:41
15393494	10783 Odd Sum	Compilation error	JAVA	0.000	2015-04-27 14:35:53
15393402	10783 Odd Sum	Wrong answer	JAVA	0.262	2015-04-27 14:11:30
15393308	10282 Babelfish	Time limit exceeded	JAVA	3.000	2015-04-27 13:53:38
15393276	10282 Babelfish	Time limit exceeded	JAVA	3.000	2015-04-27 13:47:31
15393236	10282 Babelfish	Runtime error	JAVA	0.000	2015-04-27 13:41:08
15376896	10783 Odd Sum	Wrong answer	JAVA	0.265	2015-04-24 10:44:18
15376822	10282 Babelfish	Time limit exceeded	JAVA	3.000	2015-04-24 10:14:53
15371449	10282 Babelfish	Runtime error	JAVA	0.000	2015-04-23 10:53:17
15367710	10282 Babelfish	Time limit exceeded	JAVA	3.000	2015-04-22 15:44:53
15361644	11677 Alarm Clock	Accepted	JAVA	0.252	2015-04-21 14:22:47
15361568	11677 Alarm Clock	Wrong answer	JAVA	0.266	2015-04-21 14:09:15
15361557	11677 Alarm Clock	Wrong answer	JAVA	0.229	2015-04-21 14:06:43
15361337	12502 Three Families	Accepted	JAVA	0.238	2015-04-21 13:24:44
15361195	12502 Three Families	Wrong answer	JAVA	0.262	2015-04-21 12:58:10
15361052	12250 Language Detection	Accepted	JAVA	0.488	2015-04-21 12:29:49
15360773	11172 Relational Operator	Accepted	JAVA	0.199	2015-04-21 11:15:50
15360769	11172 Relational Operator	Compilation error	JAVA	0.000	2015-04-21 11:15:22
15360714	11172 Relational Operator	Wrong answer	JAVA	0.225	2015-04-21 10:58:39

<< Start < Prev 1 2 3 4 Next > End >>



# UVa Online Judge - Purit

## My Submissions

#	Problem	Verdict	Language	Run Time	Submission Date
15360701	11172 Relational Operator	Wrong answer	JAVA	0.202	2015-04-21 10:56:02
15360678	11172 Relational Operator	Wrong answer	JAVA	0.202	2015-04-21 10:51:12
15360666	11172 Relational Operator	Wrong answer	JAVA	0.209	2015-04-21 10:48:36
15360651	11172 Relational Operator	Compilation error	JAVA	0.000	2015-04-21 10:44:59
15360634	11172 Relational Operator	Wrong answer	JAVA	0.189	2015-04-21 10:40:23
12078925	378 Intersecting Lines	Accepted	C++	0.016	2013-07-21 03:10:55
12075652	378 Intersecting Lines	Wrong answer	C++	0.015	2013-07-20 09:14:23
12075631	378 Intersecting Lines	Wrong answer	C++	0.019	2013-07-20 09:12:04
12073913	10340 All in All	Wrong answer	C++	0.032	2013-07-20 03:30:52
12073884	10340 All in All	Accepted	C++	0.022	2013-07-20 03:22:56
12073874	10340 All in All	Wrong answer	C++	0.032	2013-07-20 03:21:05
12073848	10340 All in All	Wrong answer	C++	0.035	2013-07-20 03:17:21
12073844	10340 All in All	Compilation error	C++	0.000	2013-07-20 03:16:40
12073816	10340 All in All	Wrong answer	C++	0.029	2013-07-20 03:11:34
12073798	10340 All in All	Wrong answer	C++	0.025	2013-07-20 03:07:32
12042780	10055 Hashmat the Brave Warrior	Wrong answer	C++	0.669	2013-07-13 05:21:25
12042700	10055 Hashmat the Brave Warrior	Wrong answer	C++	0.412	2013-07-13 05:15:31
12042633	10055 Hashmat the Brave Warrior	Wrong answer	C++	0.442	2013-07-13 05:09:17
12042527	10055 Hashmat the Brave Warrior	Wrong answer	C++	0.016	2013-07-13 04:57:27
12042510	10055 Hashmat the Brave Warrior	Compilation error	C++	0.000	2013-07-13 04:54:50
12042427	10055 Hashmat the Brave Warrior	Compilation error	C++	0.000	2013-07-13 04:47:34

&lt;&lt; Start &lt; Prev 1 2 3 4 Next &gt; End &gt;&gt;

## Subsection 3

Piyaphat's UVa Online Judge



# UVa Online Judge - Piyaphat

## Hausaufgaben Profile Page



Hits:	0
Online Status:	✔ ONLINE
Member Since:	2 years ago
Last Online:	5 minutes ago

### Contact Info

Hausaufgaben

**Online Judge ID:** 286287

**Results email:** No

**Virtual Judge:** No



# UVa Online Judge - Piyaphat

## Solved problems

Problem	Ranking	Submission	Date	Run time
102	6705	12044408	2013-07-13 09:14:16	0.125
264	6504	15462406	2015-05-10 22:37:59	0.412
350	4408	15467208	2015-05-12 00:38:38	0.259
382	10971	15462105	2015-05-10 20:32:41	0.212
408	3354	15467296	2015-05-12 01:06:38	0.465
412	5067	15467175	2015-05-12 00:19:11	1.355
534	2446	15493917	2015-05-16 21:58:56	0.569
543	8031	15461637	2015-05-10 18:21:43	1.702
544	2845	15496793	2015-05-17 14:05:29	0.672
576	3191	15470140	2015-05-12 13:58:12	0.169
686	5364	15461812	2015-05-10 19:05:54	0.232
960	148	15469211	2015-05-12 10:46:02	0.245
10055	27371	12043311	2013-07-13 06:25:06	0.442
10104	4015	15470106	2015-05-12 13:51:38	2.659
10139	2104	15426938	2015-05-03 18:07:00	1.795
10235	5717	15461972	2015-05-10 19:49:52	1.122
10282	3626	15434712	2015-05-05 09:56:58	2.332
10310	603	14156650	2014-09-06 07:33:13	0.012
10340	8956	12073791	2013-07-20 03:06:39	0.029
10341	3659	15428238	2015-05-03 23:33:07	0.632
10432	4142	14156889	2014-09-06 08:30:02	0.015
10474	3512	12044060	2013-07-13 08:16:38	0.762
10566	1215	15398339	2015-04-28 12:45:09	0.225
10783	17510	15361051	2015-04-21 12:29:45	0.255
10929	6562	15462338	2015-05-10 21:56:14	0.536
11063	1739	15467019	2015-05-11 22:43:06	0.332
11172	21476	15361604	2015-04-21 14:16:35	0.205
11561	678	15505721	2015-05-19 12:24:10	0.359
11677	3885	15360600	2015-04-21 10:34:04	0.225
11879	2311	15462320	2015-05-10 21:46:11	0.165
12250	4234	15393683	2015-04-27 15:07:01	0.372
12502	2116	15393808	2015-04-27 15:28:39	0.252



# UVa Online Judge - Piyaphat

## User Statistics

Piyapat (Hausaufgaben)



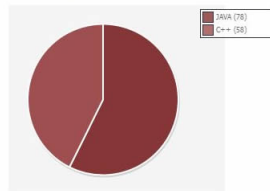
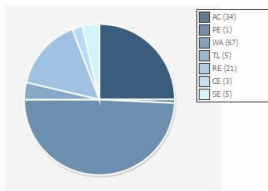
136  
SUBMISSIONS

37  
PROBLEMS TRIED

32  
PROBLEMS SOLVED

2013-07-13  
FIRST SUBMISSION

2015-06-02  
LAST SUBMISSION



# UVa Online Judge - Piyaphat

## My Submissions

#	Problem	Verdict	Language	Run Time	Submission Date
15564063	10048 Audiophobia	Wrong answer	JAVA	1.339	2015-06-02 12:58:59
15564017	10048 Audiophobia	Wrong answer	JAVA	1.365	2015-06-02 12:49:32
15564007	10048 Audiophobia	Wrong answer	JAVA	1.417	2015-06-02 12:47:07
15563984	10048 Audiophobia	Wrong answer	JAVA	1.370	2015-06-02 12:42:49
15563948	10048 Audiophobia	Wrong answer	JAVA	1.391	2015-06-02 12:38:11
15505721	11561 Getting Gold	Accepted	JAVA	0.359	2015-05-19 12:24:10
15496793	544 Heavy Cargo	Accepted	JAVA	0.672	2015-05-17 14:05:29
15496727	544 Heavy Cargo	Wrong answer	JAVA	0.645	2015-05-17 13:44:12
15493917	534 Frogger	Accepted	JAVA	0.569	2015-05-16 21:58:56
15470140	576 Haiku Review	Accepted	JAVA	0.169	2015-05-12 13:58:12
15470106	10104 Euclid Problem	Accepted	JAVA	2.659	2015-05-12 13:51:38
15470093	10104 Euclid Problem	Wrong answer	JAVA	2.695	2015-05-12 13:48:19
15470037	10104 Euclid Problem	Time limit exceeded	JAVA	3.000	2015-05-12 13:36:46
15470025	10104 Euclid Problem	Wrong answer	JAVA	2.948	2015-05-12 13:34:13
15470017	10104 Euclid Problem	Time limit exceeded	JAVA	3.000	2015-05-12 13:33:12
15469991	10104 Euclid Problem	Wrong answer	JAVA	2.942	2015-05-12 13:28:44
15469211	960 Gaussian Primes	Accepted	JAVA	0.245	2015-05-12 10:46:02
15469194	960 Gaussian Primes	Wrong answer	JAVA	0.236	2015-05-12 10:43:36
15467296	408 Uniform Generator	Accepted	JAVA	0.465	2015-05-12 01:06:38
15467270	408 Uniform Generator	Presentation error	JAVA	0.432	2015-05-12 01:03:05
15467208	350 Pseudo-Random Numbers	Accepted	JAVA	0.259	2015-05-12 00:38:38
15467175	412 Pi	Accepted	JAVA	1.355	2015-05-12 00:19:11
15467164	412 Pi	Wrong answer	JAVA	1.178	2015-05-12 00:13:11
15467155	412 Pi	Wrong answer	JAVA	1.032	2015-05-12 00:09:50
15467019	11063 B2-Sequence	Accepted	JAVA	0.332	2015-05-11 22:43:06
15466996	11063 B2-Sequence	Runtime error	JAVA	0.000	2015-05-11 22:33:42
15465488	11063 B2-Sequence	Runtime error	JAVA	0.000	2015-05-11 15:58:23
15465472	11063 B2-Sequence	Runtime error	JAVA	0.000	2015-05-11 15:55:23
15465442	11063 B2-Sequence	Runtime error	JAVA	0.000	2015-05-11 15:48:47
15465306	11063 B2-Sequence	Runtime error	JAVA	0.000	2015-05-11 15:31:44

&lt;&lt; Start &lt; Prev 1 2 3 4 5 Next &gt; End &gt;&gt;





# UVa Online Judge - Piyaphat

## My Submissions

#	Problem	Verdict	Language	Run Time	Submission Date
15465237	11063 B2-Sequence	Runtime error	JAVA	0.000	2015-05-11 15:20:58
15462406	264 Count on Cantor	Accepted	JAVA	0.412	2015-05-10 22:37:59
15462338	10929 You can say 11	Accepted	JAVA	0.536	2015-05-10 21:56:14
15462330	10929 You can say 11	Wrong answer	JAVA	0.505	2015-05-10 21:50:00
15462320	11879 Multiple of 17	Accepted	JAVA	0.165	2015-05-10 21:46:11
15462105	382 Perfection	Accepted	JAVA	0.212	2015-05-10 20:32:41
15462095	382 Perfection	Runtime error	JAVA	0.000	2015-05-10 20:25:35
15461972	10235 Simply Empir	Accepted	JAVA	1.122	2015-05-10 19:49:52
15461812	686 Goldbach's Conjecture (II)	Accepted	JAVA	0.232	2015-05-10 19:05:54
15461637	543 Goldbach's Conjecture	Accepted	JAVA	1.702	2015-05-10 18:21:43
15461365	543 Goldbach's Conjecture	Wrong answer	JAVA	1.789	2015-05-10 17:03:51
15461149	10566 Crossed Ladders	Accepted	JAVA	0.229	2015-05-10 16:15:41
15456531	264 Count on Cantor	Wrong answer	JAVA	0.506	2015-05-09 15:48:00
15456246	264 Count on Cantor	Wrong answer	JAVA	0.472	2015-05-09 15:01:41
15435635	10566 Crossed Ladders	Runtime error	JAVA	0.000	2015-05-05 13:50:56
15434712	10282 Babelfish	Accepted	JAVA	2.332	2015-05-05 09:56:58
15428423	264 Count on Cantor	Runtime error	JAVA	0.000	2015-05-04 00:54:38
15428401	264 Count on Cantor	Wrong answer	JAVA	0.219	2015-05-04 00:45:08
15428238	10341 Solve It	Accepted	JAVA	0.632	2015-05-03 23:33:07
15428227	10341 Solve It	Wrong answer	JAVA	0.682	2015-05-03 23:27:39
15428033	576 Haiku Review	Wrong answer	JAVA	0.196	2015-05-03 21:51:32
15427942	576 Haiku Review	Wrong answer	JAVA	0.149	2015-05-03 21:17:01
15427929	576 Haiku Review	Wrong answer	JAVA	0.142	2015-05-03 21:11:50
15427796	576 Haiku Review	Wrong answer	JAVA	0.145	2015-05-03 20:36:05
15427786	576 Haiku Review	Wrong answer	JAVA	0.135	2015-05-03 20:32:53
15427781	576 Haiku Review	Runtime error	JAVA	0.000	2015-05-03 20:31:01
15427772	576 Haiku Review	Wrong answer	JAVA	0.135	2015-05-03 20:28:45
15426938	10139 Factorisors	Accepted	JAVA	1.795	2015-05-03 18:07:00
15426598	10139 Factorisors	Runtime error	JAVA	0.000	2015-05-03 16:59:41
15426590	10139 Factorisors	Runtime error	JAVA	0.000	2015-05-03 16:55:53

&lt;&lt; Start &lt; Prev 1 2 3 4 5 Next &gt; End &gt;&gt;



# UVa Online Judge - Piyaphat

## My Submissions

#	Problem	Verdict	Language	Run Time	Submission Date
15398339	10566 Crossed Ladders	Accepted	JAVA	0.225	2015-04-28 12:45:09
15393808	12502 Three Families	Accepted	JAVA	0.252	2015-04-27 15:28:39
15393683	12250 Language Detection	Accepted	JAVA	0.372	2015-04-27 15:07:01
15393473	10282 Babelfish	Time limit exceeded	JAVA	3.000	2015-04-27 14:26:34
15393446	10282 Babelfish	Compilation error	JAVA	0.000	2015-04-27 14:21:58
15393298	10282 Babelfish	Runtime error	JAVA	0.000	2015-04-27 13:51:24
15361604	11172 Relational Operator	Accepted	JAVA	0.205	2015-04-21 14:16:35
15361545	10282 Babelfish	Runtime error	JAVA	0.000	2015-04-21 14:04:29
15361544	10282 Babelfish	Runtime error	JAVA	0.000	2015-04-21 14:04:19
15361421	10282 Babelfish	Wrong answer	JAVA	0.822	2015-04-21 13:41:21
15361361	10282 Babelfish	Runtime error	JAVA	0.000	2015-04-21 13:28:47
15361243	10282 Babelfish	Time limit exceeded	JAVA	3.000	2015-04-21 13:07:05
15361051	10783 Odd Sum	Accepted	JAVA	0.255	2015-04-21 12:29:45
15360792	10783 Odd Sum	Wrong answer	JAVA	0.255	2015-04-21 11:20:58
15360765	10783 Odd Sum	Wrong answer	JAVA	0.242	2015-04-21 11:14:39
15360755	10783 Odd Sum	Wrong answer	JAVA	0.225	2015-04-21 11:08:32
15360735	10783 Odd Sum	Wrong answer	JAVA	0.239	2015-04-21 11:04:33
15360600	11677 Alarm Clock	Accepted	JAVA	0.225	2015-04-21 10:34:04
14157049	10026 Shoemaker's Problem	Wrong answer	C++	0.013	2014-09-06 09:10:49
14157047	280 Vertex	Submission error	C++	0.000	2014-09-06 09:10:17
14156958	280 Vertex	Submission error	C++	0.000	2014-09-06 08:48:17
14156902	280 Vertex	Submission error	C++	0.000	2014-09-06 08:33:48
14156889	10432 Polygon Inside A Circle	Accepted	C++	0.015	2014-09-06 08:30:02
14156876	10432 Polygon Inside A Circle	Accepted	C++	0.019	2014-09-06 08:26:49
14156851	10432 Polygon Inside A Circle	Wrong answer	C++	0.015	2014-09-06 08:21:37
14156822	10432 Polygon Inside A Circle	Wrong answer	C++	0.012	2014-09-06 08:15:36
14156743	10432 Polygon Inside A Circle	Wrong answer	C++	0.009	2014-09-06 07:56:08
14156650	10310 Dog and Gopher	Accepted	C++	0.012	2014-09-06 07:33:13
14156613	10310 Dog and Gopher	Wrong answer	C++	0.025	2014-09-06 07:24:09
14156546	10310 Dog and Gopher	Wrong answer	C++	0.015	2014-09-06 07:11:02

<< Start < Prev 1 2 3 4 5 Next > End >>



# UVa Online Judge - Programming Day

Solved Problems:

Question No.	Question Name
12854	Automated Checking Machine
12894	Perfecct Flag
12896	Mobile SMS

[Table](#): Solved Programming Day Problems



## Section 2

# Kakuro Solver



# Kakuro Problem Requirement

Requirement:

Create a program to generate and solve Kakuro problems using "Genetic Algorithms".



# Kakuro Solver Problem Description

Problem:

- How to generate an effective Kakuro Puzzle?



# Kakuro Solver Problem Description

Problem:

- How to generate an effective Kakuro Puzzle?
- How to validate a Kakuro Puzzle?



# Kakuro Solver Problem Description

Problem:

- How to generate an effective Kakuro Puzzle?
- How to validate a Kakuro Puzzle?
- How to solve any given valid Kakuro Puzzle?





# Genetic Algorithms - Initialization

- Initialization → Create a *population*.



# Genetic Algorithms - Initialization

- Initialization → Create a *population*.
- A *population* consists of an *individual*.



# Genetic Algorithms - Initialization

- Initialization → Create a *population*.
- A *population* consists of an *individual*.
- Each *individual* is a possible solution to solve the puzzle.  
It is not necessary that the *individual* has to be a final solution.



# Genetic Algorithms - Evaluation

- Evaluation → Determine *fitness* value. Each *individual* has its own *fitness* value.



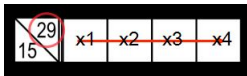
# Genetic Algorithms - Evaluation

- Evaluation → Determine *fitness* value. Each *individual* has its own *fitness* value.
- An *individual's fitness value* will determine the similarity to the ideal solution.

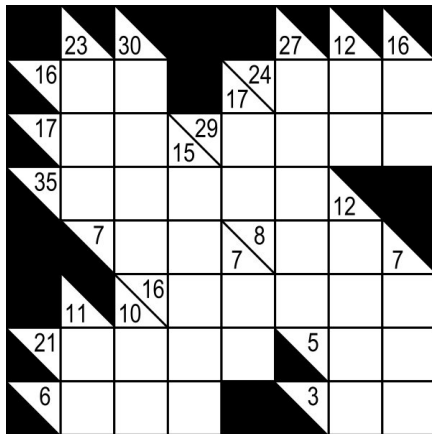


# Genetic Algorithms on Kakuro

- Each puzzle cells has a set a corresponding cells for filling solutions.



- Difference between the average of the values filled in the cells and its corresponding puzzle value.
- The *fitness* value for an ideal solution is "0.0"



# Genetic Algorithms - Evolving the Population

- Selection → Selection of best *individuals* to evolve to improve the population.



# Genetic Algorithms - Evolving the Population

- Selection → Selection of best *individuals* to evolve to improve the population.
- Crossover → Creation of new *individuals* by combining traits of current unidentical *individuals* with a hope of a better *fitness* value expected.





# Genetic Algorithms - Evolving the Population

- Selection → Selection of best *individuals* to evolve to improve the population.
- Crossover → Creation of new *individuals* by combining traits of current unidentical *individuals* with a hope of a better *fitness* value expected.
- Mutation → Randomly modify partialy the genes of individuals.

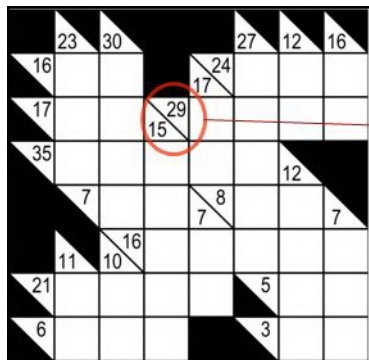


# Genetic Algorithms - Evolving the Population

- Selection → Selection of best *individuals* to evolve to improve the population.
- Crossover → Creation of new *individuals* by combining traits of current unidentical *individuals* with a hope of a better *fitness* value expected.
- Mutation → Randomly modify partialy the genes of individuals.
- REPEAT!!! → From Evaluation again until a satisfying *fitness* value is obtained.



# Kakuro Algorithm Idea



NaN	-23.00	-30.00	NaN	NaN	-27.00	-12.00	-16.00
-0.16	0.00	0.00	NaN	-17.24	0.00	0.00	0.00
-0.17	0.00	0.00	15.29	0.00	0.00	0.00	0.00
-0.35	0.00	0.00	0.00	0.00	0.00	-12.00	NaN
NaN	-0.70	0.00	0.00	-7.80	0.00	0.00	-7.00
NaN	-11.00	-10.16	0.00	0.00	0.00	0.00	0.00
-0.21	0.00	0.00	0.00	0.00	-0.50	0.00	0.00
-0.60	0.00	0.00	0.00	NaN	-0.30	0.00	0.00



**-15.29**



# Kakuro Implementation Problems

Before the implementation of the algorithm:

- Studying the Generic Algorithm.



# Kakuro Implementation Problems

Before the implementation of the algorithm:

- Studying the Generic Algorithm.
- Finding the Best Algorithm for Crossover.



# Kakuro Implementation Problems

Before the implementation of the algorithm:

- Studying the Generic Algorithm.
- Finding the Best Algorithm for Crossover.
- Finding the Best Algorithm for Mutation.



# Kakuro Implementation Problems

Before the implementation of the algorithm:

- Studying the Generic Algorithm.
- Finding the Best Algorithm for Crossover.
- Finding the Best Algorithm for Mutation.
- Kakuro Puzzles Represents.



# Kakuro Implementation Problems

During the implementation of the algorithm:

- There is an imprecision in float value division:
- → Ex:  $1.7/10 = \underline{0.16999999999999998}$  !!
- The algorithm does not improve solutions:
- → Ex: Fitness value remains constantly at "5.25".
- Ignoring the value of performing unit testing and component testing, which causes misunderstanding with the fitness value





# Suggested Solutions for Kakuro Problems

- Increase a Population Size.



# Suggested Solutions for Kakuro Problems

- Increase a Population Size.
- During a mutation of individuals, permute sets of solutions to find the best set which leads to the best fitness value.



# Programming Exercises - Final Presentation

Thank you!

