



St. Petersburg National Research University of IT, Mechanics & Optics and ACM International Collegiate Programming Contest

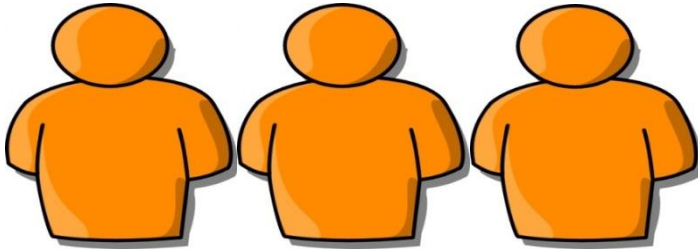
Fedor Tsarev

tsarev@rain.ifmo.ru

St. Petersburg National Research University
of IT, Mechanics & Optics



Association for Computing Machinery International Collegiate Programming Contest (ACM ICPC)



3 students



1 computer



5 hours

8-13 problems



Association for Computing Machinery International Collegiate Programming Contest (ACM ICPC)

- Since 1979 – 37 championships
- Sponsored by IBM
- Became world championship in early 90-s
- **29479 contestants – 2322 universities – 91 countries**
- Multi-tiered competition:
 - 260 Quarterfinals
 - 30 Semifinals
 - World Finals (120 teams)
- Medals are given to top 12 teams – 4 gold medals, 4 silver medals and 4 bronze medals
- 5 semifinals and 2 finals per student at most



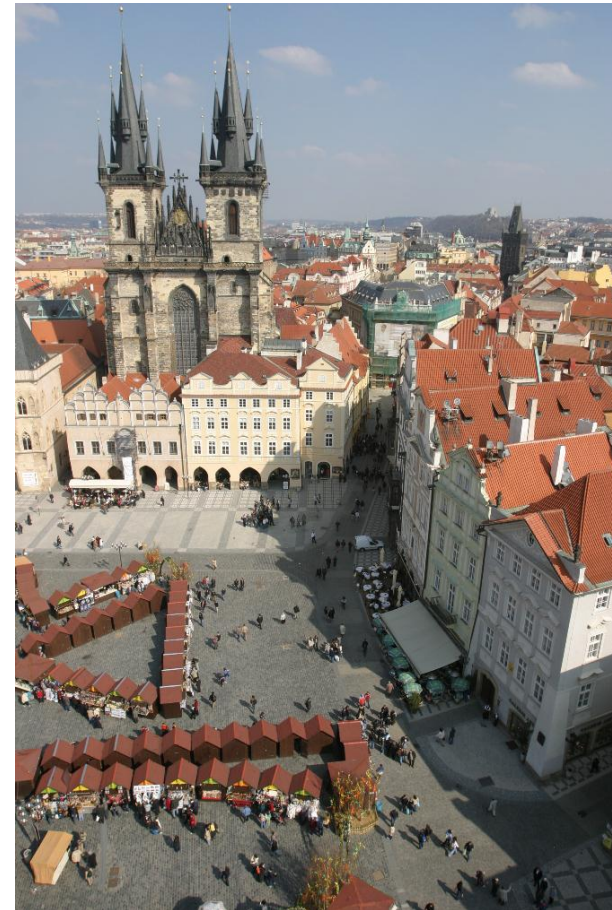
Russian teams on World Finals

- World champions:
 - 2000 – St Petersburg SU
 - 2001 – St Petersburg SU
 - 2004 – University ITMO
 - 2006 – Saratov SU
 - 2008 – University ITMO
 - 2009 – University ITMO
 - 2012 – University ITMO
 - **2013 – University ITMO**
- +more than 10 gold medals



2004, Prague, Czech Republic

- University ITMO – 1-st place
- MIT – 5-th place
- Caltech – 7-th place
- Harvard – 9-th place





2004 World Champions



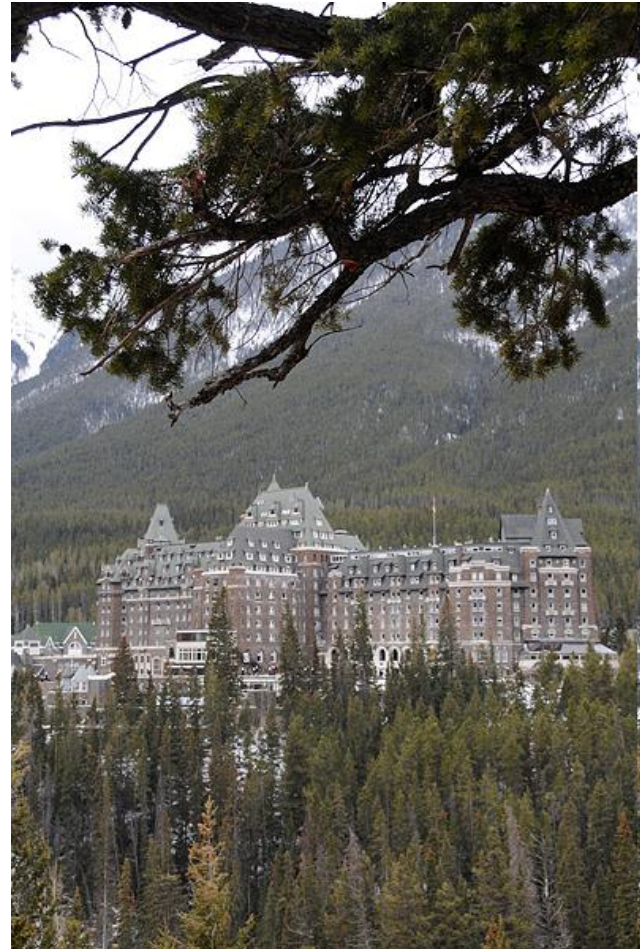
World champions 2004 and President of Russia Vladimir Putin





2008, Banff, Canada

- University ITMO – 1-st place
- MIT – 2-nd place
- Tsinghua (China) – 6-th place
- Stanford – 7-th place
- All 11 Russian teams are among top 30 teams of the world



World champions 2008 and St. Petersburg governor Valentina Matvienko



ACM Awards 2008





ACM Awards 2008





2009, Stockholm, Sweden

- University ITMO – 1-st place
- Tsinghua – 2-nd place
- Oxford – 5-th place
- MIT – 7-th place
- Carnegie Mellon – 8-th place



World Champions 2009





World Champions 2009 with President of Russia Dmitry Medvedev



ACM Awards 2009



ACM Awards 2009



2012, Warsaw, Poland

- University ITMO – 1-st place
- Harvard – 7-th place
- University of Tokyo – 11-th place



World Champions 2012





World Champions 2012 and President of Russia Vladimir Putin



World Champions 2012 and Vladimir Lenin





2013, St. Petersburg, Russia

- University ITMO – 1-st place
- Shanghai Jiao Tong – 2-nd place
- University of Tokyo – 3-rd place
- National Taiwan University – 4-th place
- Carnegie Mellon – 11-th place



World Champions 2013





Cooperation with ETH Zurich

- ETH Zurich:
 - 21 Nobel Prizes
 - Never advanced to ACM ICPC World Finals before 2011
- University ITMO:
 - Participates in ACM ICPC World Finals since 1995
 - Four times ACM ICPC World Champions
- World Champions from University ITMO regularly come to ETH Zurich for trainings
- Result – ETH Zurich team advanced to World Finals for the first time in the history (2011 – 42-nd place, 2013 – 27-th place)
- Establishment of Software Engineering and Verification Chair in University ITMO (head – Prof. Bertrand Meyer)
- Davos Informatics camps for high-school students



Research & Conferences

- Bioinformatics, machine learning, genetic algorithms
- Genetic and Evolutionary Computation Conference (GECCO 2011, 2012, 2013)
- Eighth International Conference on Swarm Intelligence (ANTS 2012)
- International Conference on Research in Computational Biology (RECOMB 2013, RECOMB-seq 2013)
- International Conference on Machine Learning and Applications (ICMLA 2011, 2012)
- Workshop on algorithms in bioinformatics (WABI-2013)



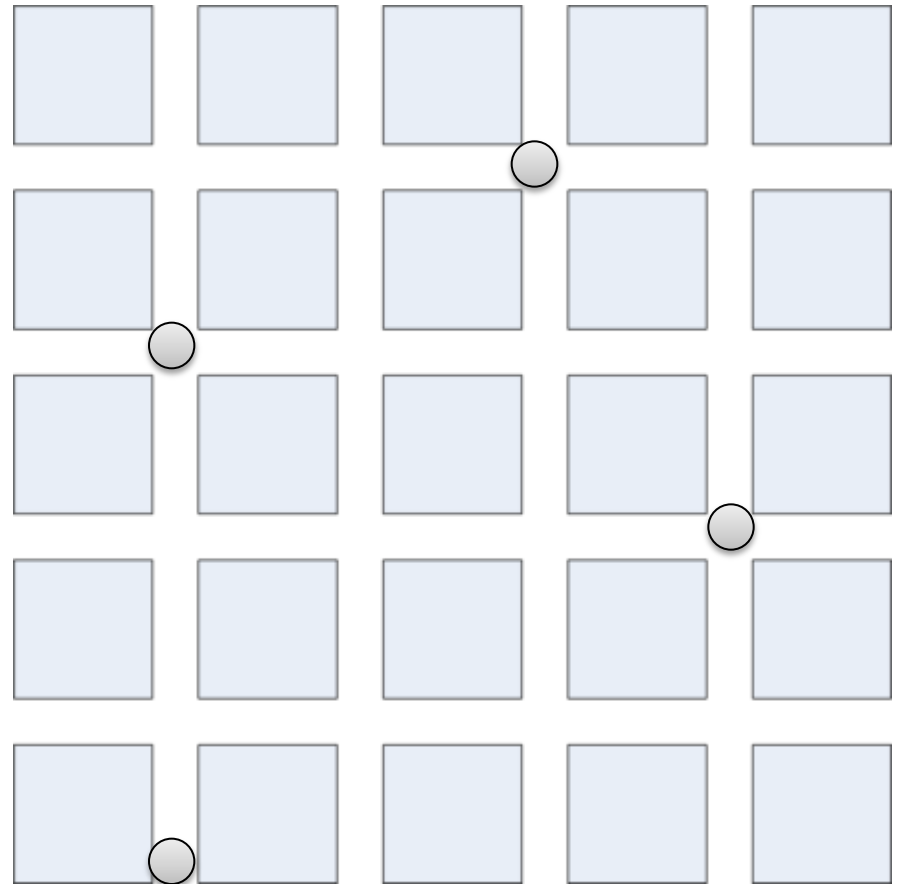
Thank you!

Thank you!



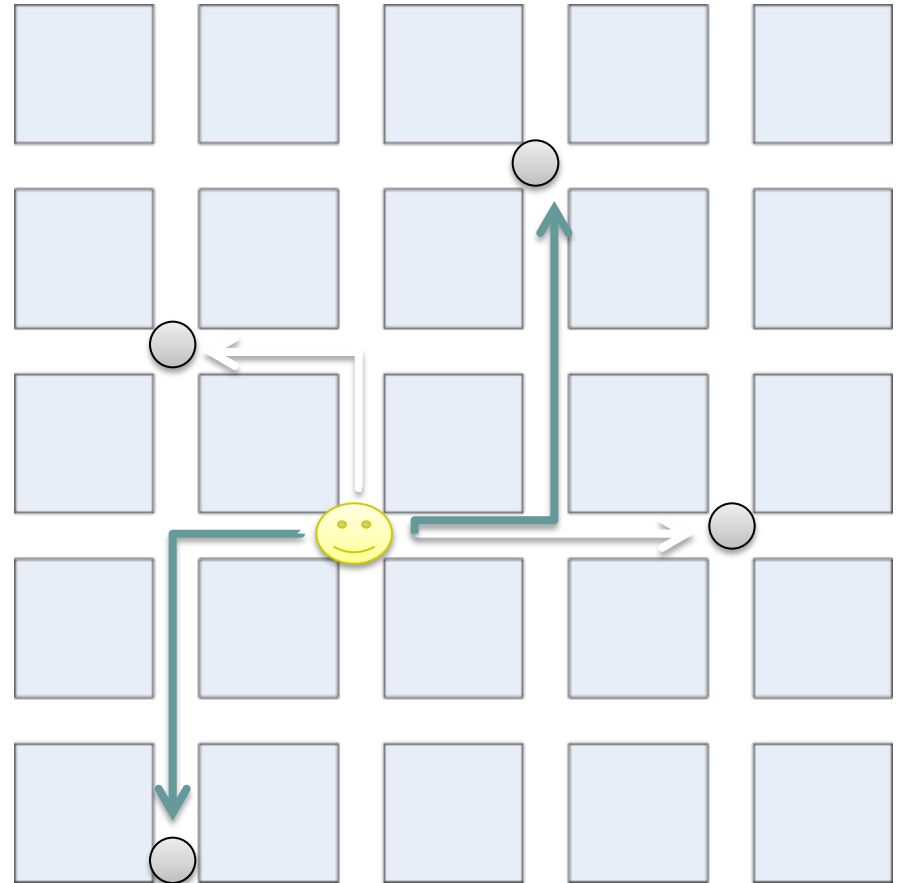
Problem Example

- Contest lasts for 5 hours
- Problem set: 8-13 problems
- Problem “Coffee Central” from ACM ICPC World Finals 2011
- Coffee shops are located at some of the intersections



Problem Example

- A person is willing to walk at most d blocks for the morning coffee
- Example: $d = 2$
- Write the program to find the location from which you can reach the maximal number of coffee shops for the morning coffee



Problem Example

- Solution for the example – from best location you can reach 3 coffee shops

