



## 1 The Rulebook

*(Or, what every contestant needs to know before entering the contest hall)*

Since 2003, ACPC collects and prints information that describes the contest, its rules, and the PC<sup>2</sup> Judging System in a booklet that got to be known as *the rule book*. Here you'll find a web-based version of the current RuleBook. Normally, a printed copy is provided to all contestants at the registration desk. You can also get the complete book in pdf, by clicking the "print" link.

Contestants, especially those participating for the first time, are strongly advised to read the RuleBook carefully to get familiar with the contest (especially the PC<sup>2</sup> Judging System) before arriving to the contest. Returning contestants are also advised to review the RuleBook for any changes since they last participated.

## 2 About The Arab Collegiate Programming Contest

*The Arab Collegiate Programming Contest (ACPC)* is a qualifying round for the *ACM International Collegiate Programming Contest (ICPC)*. ACPC is organized in the same spirit and is governed by all applicable rules of the ICPC. Winners of an ACPC contest qualify to the ICPC World Finals. An ACPC Regional Contest is normally held during November/December of each year, whereas the ICPC World Final is held in March/April of the following year.

The 2010 Thirteenth Arab Collegiate Programming Contest (ACPC2010) will be hosted by The Lebanese American University [↗<sub>2</sub>](#), Beirut, Lebanon in 24-26 November 2010.

### 2.1 The Arab Collegiate Programming Contest

The first Arab Collegiate Programming Contest [↗<sub>1</sub>](#) (then called The Arab & North Africa Regional Contest (ANARC)) was hosted by Al Akhawayn University [↗<sub>3</sub>](#) in 1998 thanks to the efforts of Mr. Sidi Ali Maelainin, then Associate Director for Development at Al Akhawayn University in Ifrane, Morocco. Eight Universities from four countries participated in the first ANARC. Since then, the contest have witnessed significant participation. In 2007, 45 teams from 9 countries participated in the Tenth Regional Contest hosted by The Arab Academy for Science and Technology, Alexandria, Egypt. The 2005 contest (hosted by Kuwait University,) witnessed the largest participation as teams from 14 Arab countries. The last few years included teams from: Algeria, Bahrain, Egypt, Jordan, Kuwait, Lebanon, Morocco, Oman, Palestine, Saudi Arabia, Sudan, Syria, Tunis, United Arab Emirates, and Yemen.

### 2.2 The ACM International Collegiate Programming Contest

The ACM International Collegiate Programming Contest (ICPC) [↗<sub>4</sub>](#) is organized and conducted yearly under the auspices of The Association of Computing Machinery (ACM) [↗<sub>5</sub>](#). Started in 1970 at Texas A&M University, with the first World Finals held in 1977. The contest have then grown exponentially in the number of participating universities. In 2009/2010, 22,000 students from 1931 universities in 82 countries competed for the bragging rights of being the World's Programming Champions.

The ACM programming contest provides college students an opportunity to demonstrate and sharpen their problem solving and computing skills. The contest is a two-tiered competition among teams of students representing institutions of higher education. The winning teams of the regional contests advance to the contest finals. The 2011 World Finals will be held in Sharm El Shaikh, Egypt.

### 2.3 The Contest

The contest lasts for five hours. Students compete in teams against teams from other Universities. Each team is made of three students who pass the eligibility rules for the specific year. Each team has to solve a set of about ten problems using a single computer. Solutions involve writing program using C, C++, or JAVA. Team solutions' are run against a secret test data and their output are compared to that of a Judges' program. Teams are ranked based on the number of problems they manage to solve and the penalties they accumulate. Penalties reflect the time taken to solve a problem and the number of failed attempts. Contestants may bring reference materials such as books and manuals; but neither machine-readable versions nor electronic devices are allowed.

To get an idea on how to get contestants ready, including an archive of the problems previously used in ANARC and ICPC, go to this page [↗<sub>6</sub>](#). For more detailed information about the contest, check the RuleBook [↗<sub>7</sub>](#)!

### 3 General Rules

The following rules apply throughout the event:

1. Smoking is prohibited during all activities.
2. Contestants must attend all activities.
3. All participants must wear their badge for all activities.
4. Contestants (and reserve) must wear the official contest T-shirt during the contest. (You're free to wear the T-shirt for any other activity.)

### 4 Rules Inside the Contest Hall

In addition to the General Rules listed above, the following rules apply during the contest:

1. Contestants may only bring printed material to the contest hall. **No electronic devices or media are allowed inside the hall.** Computers, calculators, CD's, disks, music players, flash memory, etc. are all prohibited. (Contestants may use the calculator that comes part of the operating system.)
2. Cellular phones (mobiles) are strictly prohibited inside the contest hall.
3. All printed material needed during the contest must be brought into the contest hall during the practice session. **No material will be allowed in on the contest day.**
4. All bags brought into the contest hall will be checked.
5. **Contestants are not allowed to talk to their coaches during the contest.** In general, contestants are not to converse with anyone except members of their team and personnel designated by the regional contest director.
6. A team may be disqualified by the regional contest director for any activity that jeopardizes the contest such as dislodging extension cords, unauthorized modification of contest materials, or distracting behavior.
7. Until the contest begins, contestants are not allowed to touch anything at the team workstation until so directed by the Regional Director or Contest Hall Supervisor.
8. **You're not allowed to change your PC<sup>2</sup> password.** Any attempt to change it, will result in your team's disqualification.

## 5 The 2010 Rules for Eligibility

In an ICPC contest, contestants compete in teams. Each team consists of three contestants who are eligible to compete in the ICPC World Finals. Each team contestant must satisfy both the "Basic Requirements" and "Period of Eligibility" rules as explained below. Note that under certain circumstances, the "Period of Eligibility" may be extended; See below.

### Basic Requirements

1. A student must be willing and able to compete in the World Finals.
2. A student must be enrolled in a degree program at the sponsoring institution with at least a half-time load. This rule is not to be construed as disqualifying co-op students, exchange students, or students serving internships.
3. A student may compete for only one institution during a contest year.
4. A student who has competed in two World Finals is *not eligible to compete*.
5. A student who has competed in five Regional Contests is *not eligible to compete*.

### Period of Eligibility

1. A student who meets the Basic Requirements and first began post-secondary studies in 2006 or later is eligible to compete.
2. Or; A student who meets the Basic Requirements and was born in 1987 or later is eligible to compete.
3. **Coaches may petition to extend the Period of Eligibility under the following circumstances:**
  - A coach may petition the ICPC Eligibility Committee to extend the Period of Eligibility for a student whose full-time studies have been interrupted or extended. This includes military or civilian service, illness, work/studies, or personal reasons.
  - The coach must demonstrate that such an extension would not provide an unfair advantage to the team.
  - A petition will be approved routinely if the student meets the Basic Requirements and has not completed more than the equivalent of eight semesters of full-time study as of the date of the regional contest.
  - To make such a request, please check the ICPC website. ↗<sub>8</sub>.

## 6 Appeals

The ICPC International Steering Committee who's responsible for establishing contest rules, policy and guidelines, have set the following rules when it comes to complaints, appeals, and their remedies. The official page for Appeals can be found by following this link [↗](#).

If irregularities or misconduct are observed during the contest, team members or coaches should bring them to the attention of the contest officials so that action may be taken as soon as possible.

After the conclusion of the contest and the results have been made public, coaches may file complaints or appeals by email to the Regional Contest Director and copied to the ACM Contest Manager [manager@icpc.baylor.edu](mailto:manager@icpc.baylor.edu) **within two business days**.

The process of resolving the appeal is governed as follows:

1. The results of the regional contest are not final until the complaints and appeals process has run its course.
2. Only coaches may file complaints and appeals.
3. An appeal must be based on one or more of the following circumstances: violations of the Rules, misconduct by teams, or gross misconduct by contest officials with the intent to do harm.
4. The decisions of the judges are final. Specifically, a decision on a problem submission MAY NOT be appealed.
5. The Appeals Committee overturns decisions only under extraordinary circumstances.
6. The decision of the Appeals Committee is final.
7. No additional finals invitations will be given to remedy a complaint.
8. All complaints will be acknowledged.
9. An appeal will be automatically rejected if the above procedure is not followed.

## 7 Contest Format

- The contest will last exactly five hours (unless there is an unforeseen difficulty that requires extending the time.)
- The contest problem-set is made of eight to twelve problems. Each team attempts to solve as many problems as possible using a single computer.
- The programming languages for ACPC are: C, C++, or JAVA. Contestants are free to choose the programming language(s) they want to use.
- A contestant may submit a claim of ambiguity or error in a problem statement by submitting a clarification request. If the judges agree that an ambiguity or error exists, a clarification will be issued to all contestants.
- Once a team solves a problem, they submit their solution for judging. Solutions to problems submitted for judging are called runs. Each run is judged as accepted or rejected, and the team is notified of the results.

Notification of accepted runs may be suspended at an appropriate time to keep the final results secret. Notification of rejected runs will continue until the end of the contest.

- Solutions are judged by running them against some secret test cases. The contest judges are solely responsible for determining the correctness of the submitted solutions and their decision is final.
- Rejected runs are further classified into:
  - **Syntax error:** The program failed to compile.
  - **Run-time error:** The program crashed during run.
  - **Time limit exceeded:** The program failed to terminate within the allowable time period.
  - **Wrong answer:** The program terminated successfully, but the output wasn't correct.
  - **Presentation Error:** The program terminated successfully, but the output wasn't formatted as expected.Note that getting this error doesn't mean that the output is correct, it is possible for the output to be wrong too. Judges will return the first of the two errors they notice.
- If a run is rejected, the team is free to try again and send as many runs as they wish until the problem is solved (but make sure you understand the scoring rules. ↗<sub>10</sub>)

## 8 Problem Format

- Every effort is made to guarantee that problems avoid dependence on detailed knowledge of a particular application area or particular programming language.
- Each problem will require reading input from a specific text file, and printing its output to the standard console.

Hint to coaches: Make sure at least one team member can read data from text files.

- Since judging is a semi-automatic process, it is mandatory for the program output to match the output format specified in the problem description.
- The judges' secret input file will test the program on multiple cases (or datasets.) The format of the input file will be designed so that multiple datasets can be included in a single text file.
- Each problem in an ACPC contest is specified in the following four sections:
  - **Description:** This section specifies the problem contestants are supposed to solve.
  - **Input format:** Here you'll find detailed description on how the input file will be formatted.
  - **Output format:** This section specifies the format of the output of your program. Your program's output must conform to the format specified.
  - **Sample Input/Output:** Here you'll find a sample Input/Output that has successfully passed the judges' program.

Note that your program will be tested on a different (and more complex) dataset. Just because your program passed the sample Input/Output, doesn't mean it is correct.

- In addition, the problem statement will specify the name you should use for your program, and the name of the input file.

Since compilation and testing is an automated process, it is important that you follow the naming convention exactly.

For example, if the problem statement states that the files should be named easy then the program file must be named named easy.c for a C program, easy.cpp for a C++ program, or easy.java for a JAVA program. The input file will be named easy.in

## 9 Programming Your Solutions

- Programs must be in a single source file with the name specified in the problem description; failure to meet this requirement is a **"Syntax or Compilation Error"**.

A note to Java programmers: You can still have more than one top-level classes in a single source file as long as only the main one is declared public while the rest are unqualified (i.e. just `'class'`, without `'public'`).

- Output will be judged using a file comparison utility. Output must be exactly as specified in the output format section: Spelling, punctuation, spacing, and case (uppercase/lowercase) are all significant (unless specified otherwise in the problem statement.)
- Your program cannot require any intervention from the user. All input must be read from the input file.

If you submit a program that requires user intervention, you'll most probably receive a **"Time-Limit Exceeded"** error.

Contestants who have the habit of placing a "press any key to continue" statement at the end of their program should pay attention to this point.

- Do not use drive and/or path specifications when naming input files. The input file will be in the same directory as your program.
- All test cases used in judging will conform to the input specifications. There is no point for your program to try to detect invalid input or missing input file.
- Make sure your program will compile and run using the Judges environment. **Use the PC<sup>2</sup> test button.**

The PC<sup>2</sup> section of the RuleBook includes more helpful hints.

## 10 Contest Scoring

Here you'll find a description on how teams are ranked during an ICPC contest, including the ACPC regionals:

1. Teams are ranked in a descending order according to the number of problems they solve.
2. Teams who solve the same number of problems are ranked ascendingly by *total time (the score)*.
3. The total time (aka score) is the sum of the time consumed for each problem solved.
4. The time consumed for a solved problem is the time elapsed from the beginning of the contest to the submittal of *the accepted run*; **plus 20 penalty minutes for every rejected run (for that same problem.)**
5. There is no time consumed for a problem that is not solved (even if there are rejected runs for it.)

For example, consider the following team which submitted 6 runs, three for problem A, two for problem B, and one for C. For each submitted run, the table shows the time of the submission, for which problem, and the judges' response for that particular run.

<b>Time</b>	18	24	57	63	81	98
<b>Problem</b>	A	A	B	C	B	A
<b>Judge's Decision</b>	no	no	no	yes	no	yes

For solving problem C, the time consumed is 63 minutes. For solving problem A, the time consumed is 98 plus  $2 \cdot 20$  for the two unsuccessful runs. So the total time for this team  $63 + 98 + 2 \cdot 20 = 201$ . (Notice that no penalties were added for problem B since it wasn't solved correctly.)

### 10.1 Resolving Ties

Teams solving the same number of problems with the same total time are ranked by the geometric mean of the individual times for each solved problem (smaller being better) without the penalties. Any remaining ties are left unbroken unless they affect the regional winner, in which case they are broken by a coin flip.

*(Adopted from the Mid-Central USA Region)*

### 10.2 Judges' Decisions

Judges are solely responsible for accepting or rejecting submitted runs. In consultation with the judges, the Regional Contest Director determines the winners of the regional contest. The regional contest director and judges are empowered to adjust for or adjudicate unforeseen events and conditions. Their decisions are final.

*(The ICPC Regional Rules)* ↗<sub>11</sub>

## 11 The Awards

In addition to recognizing the top teams of the contest, ACPC awards the following four titles:

### **Extreme Programmers**

Awarded to the team that submits the first successful run.

In case of a tie, the title goes to the team with the minimum penalties for that problem.

### **Steadfast Gurus**

Awarded to the team that submits the last successful run.

In case of a tie, the title goes to the team with the minimum penalties for that problem.

### **Solid Programmers**

Awarded to the team solving the most number of problems without penalties.

In case of a tie, the title is awarded to the team having the least geometric mean of their submission times.

### **Relentless Programmers**

Awarded to the team that solves a problem after the most number of wrong submissions.

In case of a tie, the title is awarded to the team who submitted the successful run later.

## 12 Using PC<sup>2</sup>

The PC<sup>2</sup> System (pronounced Pee-See-Squared, short for *Programming Contest Control*) is used during the contest as the only method of communication between teams and judges. PC<sup>2</sup> provides facilities for both submitting runs and for requesting clarifications. In addition, during a contest, PC<sup>2</sup> generates the scoreboard that is viewed by both contestants and spectators.

### URL Links

- ↗ 1 <http://www.acm-acpc.org>
- ↗ 2 <http://www.aast.edu>
- ↗ 3 <http://www.aui.ma/>
- ↗ 4 <http://icpc.baylor.edu/icpc/>
- ↗ 5 <http://www.acm.org>
- ↗ 6 <http://www.acm-acpc.org/direct/training>
- ↗ 7 <http://www.acm-acpc.org/direct/rulebook>
- ↗ 8 <http://cm2prod.baylor.edu/ICPCWiki/Wiki.jsp?page=Regional%20Rules#section-Regional+Rules-TeamComposition>
- ↗ 9 <http://cm2prod.baylor.edu/ICPCWiki/Wiki.jsp?page=Regional%20Rules#section-Regional+Rules-ComplaintsAppealsAndRemedies>
- ↗ 10 <http://www.acm-acpc.org/direct/scoring>
- ↗ 11 [http://icpc.baylor.edu/icpc/Regionals/About.htm#Regional\\_Scoring](http://icpc.baylor.edu/icpc/Regionals/About.htm#Regional_Scoring)

### About This Document

This document is part of *The ACM/ICPC Arab Collegiate Programming Contest* website, <http://www.acm-acpc.org> ↗<sub>1</sub>. Send queries and comments to [info@acm-acpc.org](mailto:info@acm-acpc.org).

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