

UIL Computer Science

District Programming Contest – Director's Guide

District Meet and Computer Science Contest Directors

- The Computer Science Contest Director (CSCD) is a designated UIL official, and as such has the authority to make decisions regarding the management of the contest to ensure that it is conducted according to UIL rules.
- The Computer Science Contest Director also has the authority to settle any disputes that might arise in accordance with UIL rules.
- If a situation should arise that you are not sure how to resolve, or if you have any questions regarding rules, procedures, etc., please feel free to contact David Trussell, UIL Director of STEM Activities, at the UIL state office: dtrussell@uilitexas.org, or 512-232-4926.

Introduction: Thank you for hosting the UIL Computer Science district competition. The Programming component is an official part of the district level contest and counts toward team scores. **By rule, programming MUST be conducted if you have more than one team entered;** if only one team is entered in your district contest, conducting programming is encouraged but not required. If you have any questions about these instructions please contact David Trussell, UIL Director of STEM Activities, using the contact information listed above.

The rest of this guide consists of two parts. The first details the District Meet Director duties. The second details duties of the Computer Science Contest Director, who is appointed by the District Meet Director. Included with the duties of the Computer Science Contest Director are the instructions for and the duties of other personnel needed to run the Computer Science Programming contest.

Fundamental Contest Rules

- **Teams:** For the Programming component, three team members participate. If a team has four members the coach decides which three members participate in Programming. There must be at least three contestants present to participate in team competition.
- **Hardware:** Each team has one computer** consisting of a single monitor, keyboard, and system. If laptops with external keyboards are used, the laptop keyboard must be covered in some way. Teams may use one printer, but a printer is not required.
- **Software:** The computer may be loaded with normal software (word processors, etc.), the JDK, and a development environment (JCreator, Eclipse, NetBeans or whatever IDE the team chooses).
- **Media:** For non-networked contests, the most common media format is the USB flash drive. Teams should have at least 3-4 flash drives so they can submit more than one solution at a time.
- **Allowed resources:** The documentation for the Java API's, and the API's themselves may be installed on a team's computer. Teams may also have up to two hard copy published textbooks or reference books that are reasonably free of handwritten notes.
- **Non-allowed resources:** It is important that the computer system be free of any code written by the contestants or coach prior to the contest, such as solutions to practice problems, solutions to prior contest problems, or programs written in class. A book on a CD or on a team's hard drive is not an acceptable reference and should be removed from the computer system.

Contest Materials from UIL – Make necessary copies and keep secure until given to the CSCD on the day of the contest.

- Problem Set packet (the tests) – distribute one copy to each team at beginning of contest. Remaining copies are for judges' reference. ***After inventory, keep this packet sealed until contest.***
- Judging packet – contains CD with judging software and contestant sample data files, plus printed instructions, as well as original documents to be copied for precontest team packets. Make one packet for each team prior to contest day.

** - see note on 2021 computer rule modification at the end of this document

District Meet Director Duties (well in advance of contest date)

- Appoint a Computer Science Contest Director (a Computer Science coach is good)
 - The Computer Science contest director is in charge of the contest and has final say on issues involving judging solutions.
- Meet with the CS Contest Director (CSCD) early.
 - Schedule the contest time slot. (Check conflict pattern for a 2.5 hour slot for the Programming session, plus time for equipment setup).
 - Assign a room for the contest.
 - Each team should have at least 5 feet of table space, 3 chairs, and a power source.
 - There should be a clock visible for all contestants.
 - The judging area should be separate from the contestants' area but close by to allow a timely flow of solutions and results.
 - Determine where the contest results and queries will be posted.
 - Determine if the host school will provide a computer system for each team or require each team to provide their own system (EXACTLY ONE computer system** per school). The most common setup is that teams provide their own computers.
 - Determine what computer system will be used for the judging room (1 or 2 systems for up to 8 teams) and who will install Java and other necessary software.
 - In consultation with the CSCD, determine what judging platform you will use:
 - Compile and run the program manually, and check the results against the Judges packet.
 - Use the DOS-based judging program provided by the UIL.
 - Use PC² to run a networked contest (see page 7 of this guide).
 - **Make arrangements to provide the UIL Programming Judging Materials to the CSCD several days prior to the contest date.**

District Meet Director Duties (On the contest date before the competition)

- Have the following ready for the contest director:
 - signs with team number and school name.
 - scratch paper and pencils.
 - timer or stopwatch.
 - signs for judging, archive and scorekeeper stations as needed.
 - name tags for contest personnel.
 - Precontest team packets – One 10x13 brown envelope per team, each clearly marked "Precontest Materials" containing (original documents for copying are included in the Judging packet):
 - One copy of the Programming Session Instructions page.
 - One copy of the dry run problem (dry run is problem number 0).
 - One Team Verification sheet (colored paper).
 - You may wish to provide each team with a copy of the data file for the dry run problem.
 - ~ *The three items below are not needed for networked contests using PC². ~*
 - 3 or more manila run envelopes (9x12).
 - 13 run sheets.
 - 4 Clarification Request sheets. (colored paper).
 - Problem Set packet – contains 12 copies of the problem set. The packet will be opened and one copy given to each team immediately prior to beginning the contest. Remaining copies are to be used by judges.
 - Judging materials (download) – contains the contest data files, judging software, instructions, and other information needed by the contest director.
- AFTER THE CONTEST – Complete verification procedures and online entry of results.

**** - see note on 2021 computer rule modification at the end of this document**

UIL Computer Science

District Programming Contest

Computer Science Contest Director's Guide

The following is a chronological list of duties for the Computer Science Contest Director. *Note that specific procedures will vary somewhat depending on the number of teams and judging platform used, particularly if running a networked contest using PC².*

Computer Science Contest Director (CSCD) Duties - before the contest day

- Appoint additional personnel to assist in running the district Programming contest. For a 6-8 team district the CSCD will need:
 - 1 or 2 assistant judges - The CSCD along with the additional judges will judge solutions submitted by the contestants. Coaches from district schools are encouraged to act as judges.
 - Appoint 1-2 room monitors (Coaches or willing teachers are good room monitors)
 - The room monitor(s) will assist with checking teams in and then seat them.
 - The room monitor(s) will circulate in the room to see that all teams are adhering to contest rules both before and during the contest.
 - The room monitor(s) will supervise the runners when they are in the contest area.

For non-networked contests, also appoint the following:

- Appoint a scorekeeper and archivist - These may be separate or combined positions or the CSCD and the assistant may do this depending on the number of competing teams.
 - The archivist backs up solutions submitted by teams prior to them being judged
 - The scorekeeper records results of contestant's solutions using the provided scoring program
- Appoint 1-2 runners (adults) to work under the supervision of the room monitor
 - The runners pick up solutions from the contestants and take them to the judging area to be archived, judged, and scored
 - The runners also return judged submissions to the teams
- See that the judging software is installed on the judging stations (current JDK required)
It is strongly recommended you install and verify the judging software works several days prior to the day of the contest. This will allow you enough time to resolve any problems you may encounter due to your school's computer systems and/or security measures.
 - If needed, install the scoring program for the Scorekeeper.
 - If needed, set up archiving directories for the Archivist.
 - Install the judge's data on the judging stations. If you use the UIL-provided judging environment or PC² setup, the judging data should be installed automatically.
 - Test the judging software. A sample solution to the dry run problem is provided on the judging CD and can be used for testing.
 - If applicable, test the Scorekeeper's software, and the Archivist's station.
- **Create sample data disks for contestants.** A folder containing the student sample data files is included on the Judging CD. Make one flash drive per team – **include the sample data files ONLY.** Distribute at the same time problem sets are distributed to teams, just before the 2-hour contest time begins.

CS Contest Director Duties (contest day)

- Obtain signs from the Meet Director and post them to identify each station and team area.
- Ensure judging, archivist and scorekeeper stations are set up.
- Ensure Precontest Material packets are ready for distribution as students check in.
- Ensure Official Contest Materials are ready for distribution at the beginning of the contest.
- Train judges, archivist, and scorekeeper on the software and their duties.
- Train runners on their duties.
- Ensure Judges materials are ready for distribution after the contest begins.
- Give name tags to contest personnel.

**** - see note on 2021 computer rule modification at the end of this document**

CS Contest Director Duties (60 minutes or more before the start of contest)

- Check-in: CSCD or an assistant will check teams in and confirm the members' names.
- Team Members: In the Programming session, three team members participate. If a team has four members the coach decides which three members participate in the Programming competition. There must be at least 3 members present to participate in team competition.
- Precontest Packets: Give the teams their Precontest Materials packet as they check-in.
- Dry run: At check-in, explain to each team the process for submitting their dry run solutions.
 - The dry run problem is a simple problem to ensure understanding of the contest operations and to be sure the contestants, the runners, archivist, judges and scorekeeper are all working together.
 - The dry run problem statement, data files and a sample solution are included with the judging materials. Teams may have a working version of the solution prior to coming to the contest. If not, they should write the solution as soon as they have their system set up.
 - After the teams have their computer system set up, they are to place the source code for their dry run solution on a flash drive and place the drive and completed run sheet into a run envelope and give it to a runner when told by the CSCD, or submit over the network.
 - For non-networked contests, a runner will take the run envelope to the archivist, who will archive it and give it to the judge to be judged.
 - The judge will compile and run the contestant's solution using the judging data. Expected results are compared to the actual results from the contestant's solution.
 - The judges will then respond via the PC² software, or record on the run sheet if the solution is accepted or rejected and place the flash drive and run sheet into the run envelope.
 - For non-networked contests, the run envelope next goes to the scorekeeper. The scorekeeper will record the results and give the run envelope to the runner who will return it to the contestants.
 - Teams may continue to submit solutions to the dry run problem until they get it correct or until the time for submitting the dry run is over. It is NOT required that each team have a correct dry run solution before continuing with the contest.
 - Contestants may confer with their coach in the contest room during the dry run process.
- Monitoring: The CSCD or an assistant will monitor the contest room as teams set up their computer systems and complete their dry run.

CS Contest Director Duties (30 minutes prior to the start of contest)

- Ensure teams have a single computer**.
 - Each team is allowed one computer** consisting of a single monitor, keyboard, and system. If laptops with external keyboards are used, the laptop keyboard must be covered in some way (for example, a piece of paper may be taped over the keyboard). Teams may use a printer, but this is not required. The team may have a back-up computer system provided it is packed and stored in a nearby area (e.g. front of room) unless actually needed.
- Ensure all previously written programs have been removed from the contestants' computer systems.
 - Allowed Software: The computer may be loaded with normal software (such as word processors, etc.), the JDK, and a development environment (such as JCreator, Eclipse, NetBeans, or whatever IDE the team chooses, including any sample files installed with the software).
 - Allowed resources: The documentation for the Java API's, and the API's themselves may be installed on a team's computer. Teams may also have two hard copy published textbooks or reference books that are reasonably free of written notes.
 - Non-allowed resources: It is important that the computer system be free of any code written by the contestants or coach prior to the contest such as solutions to practice problems, solutions to prior contest problems, or programs written in class. A book on a CD or on a team's hard drive is not an acceptable reference and should be removed from the computer system.

*** - see note on 2021 computer rule modification at the end of this document*

CS Contest Director Duties (15 minutes prior to the start of contest)

- Assemble contestants and coaches for instructions. Go over contest rules on the front cover of the contest problems and go over any pertinent procedures from the UIL Computer Science Handbook.
 - There are 12 problems on the test.
 - Explain the scoring.
 - Each correct solution will score 60 points.
 - Each incorrect solution will score -5 points **only if** a correct solution is eventually submitted.
 - The contest will last for 120 minutes.
 - Teams may work on the problems in any order.
 - Go over the contest mechanics, explaining either PC² submission and clarification procedures, or the following information for non-networked contests:
 - Complete a run sheet with their team number and problem number on it
 - Save the source code (.java file) to a flash drive
 - Place both the run sheet and the flash drive in the run envelope for that problem.
 - Hold the envelope HIGH in the air for a runner to collect.
 - The runner will return the problem as soon as it is judged and recorded.
 - Clarification Requests - The Clarification Request, whether through PC² or printed form, is used to pass information between a team and the judges. The purpose of the request is to resolve ambiguities in a problem statement. **They are not to be used to give teams an advantage, extra information, or hints on how to solve a problem.** The contest director must decide on the appropriate response in consultation with the other judges. It may well be that the appropriate response is for the team to read the problem statement more carefully and look at the given examples. If a clarification is in fact required due to ambiguity or a problem misstatement, all teams should be made aware of the resolution.
 - The judging data will include test cases not shown on the problem statement sheet.
 - When the 120 minutes is over, you will say "Stop". At this time, you will stop the contest on the PC² server. For non-networked contests, state clearly that you will only accept solutions that are already in a run envelope, with the run envelope in the air.
 - When the contest is over, teams will assemble their Run sheets (if applicable) and complete their Team Verification form. Each team will then give their Verification sheet to a runner who will take it to the judging room.
 - Students may not disassemble their computers until all judging is complete and all questions have been resolved. Once a team disassembles their computer system, they forfeit their right to further questions on problems or judging.
- Instruct the teams to delete their dry run solution from their computers.
- Answer any final questions.
- Ask the coaches that are not helping to run the contest to leave or be room monitors.
- Distribute Official Contest Materials (Problem Sets and contestant sample data disks). Instruct students not to open them or insert the disks until they are told to "Start".

CS Contest Director Duties (Conducting the Contest)

- Pass out the Official Contest Materials.
- Set the timer to 120 minutes.
- Announce "Start" and start the stopwatch or the PC² contest server. This is the official start of the contest; contestants may open their contest envelope and have two hours to submit solutions.
- When a team has a possible solution to a problem, they place the source code on a flash drive, place the drive in a run envelope with a run sheet and give it to runner (or submit over the network).
- For non-networked contests, the runner takes envelopes to the archivist.

*** - see note on 2021 computer rule modification at the end of this document*

- **Archivist Duties: The archivist:**

- Records the team number and problem number for the submission.
- Records the time the problem was submitted.
- Backs up the solution submitted.
- Gives the run envelope to a judge.

- **Judges Duties:** Submissions should be maintained in a first in first out order. As judges become available they should judge the oldest submission.

- If using the judging environment provided, follow the instructions provided in "How to Use the Judging Environment."
- If not using the judging environment:
 - Create a folder for each team.
 - Copy the file to the team's folder.
 - Remove the flash drive from your computer.
 - Compile and run the program submitted.

- **Regardless of platform, USE THESE JUDGING GUIDELINES:**

- White space differences at the end of lines or after the last line of output are never significant and should never cause a solution to be judged as incorrect.
- If the differences do not seem material to the problem being solved, err on the side of accepting the solution. For instance, if a problem is about performing a complex calculation, be flexible with output formatting. On the other hand, if the problem is all about formatting, then be a stickler.
- Above all, be consistent with your judging.
- If a submission is correct, accept on PC² or mark accept on the run sheet.
- If a submission is incorrect, reject on PC² or mark reject on the run sheet and check one of the comments indicating reason for rejection. At the state meet judges generally only use a small number of the available comments:
 - "Does Not Compile" is used for submissions that suffer compile errors.
 - "Run-time Error" is used for submissions that suffer a runtime error or exception.
 - "Failed Judges' Test Data" is used for any cases where the submission compiles and runs but whose output does not match the expected answers.
 - "Time-Limit Exceeded" is used when a submission results in an infinite loop or the program does not end. None of the problems in the district problem set require a large amount of computation. A general guideline for when to halt a team's program is 2 minutes.
 - For non-networked contests, after judging the solution and marking the run sheet, the submission flash drive and run sheet go back into the run envelope which is given to the Scorekeeper.

- **Scorekeeper Duties:** For non-networked contests, the scorekeeper records successes and failures of the team's solution using the provided scoring program, then returns the run envelope to the runner.

- Correct solutions are awarded 60 points less any penalty points.
- Incorrect solutions are penalized 5 points for EACH time an incorrect solution is submitted ONLY WHEN the correct solution is finally submitted. For example:
 - Team A submits two incorrect solutions for problem 3 and never submits a correct solution. Team A will receive no points and will be assessed no penalty points for problem 3.
 - Team B submits two incorrect solutions for problem 4 and then submits a correct solution. Team B will receive 50 points for problem 4. This is 60 points for submitting the correct solution minus 5 points for EACH incorrect submission (a total of 10 penalty points).

- **After recording** by the Scorekeeper, a runner returns the run envelope to the team.

- If a team's solution is judged incorrect, the team may rework their solution and resubmit their new solution. Teams may make as many submissions for a given problem as they wish.
- All teams should be notified when 15 minutes are remaining in the contest.

Note: Coaches may fill any of the above positions, and one person may serve in more than one of these positions.

*** - see note on 2021 computer rule modification at the end of this document*

CS Contest Director Duties (Ending the Contest)

- At the 120 minute mark, teams shall be told to stop. For networked contests, stop the PC² server at this time.
- For non-networked contests, accept any solutions that are in a run envelope and being held up in the air when the signal to stop was given.
- No further submissions are to be accepted.
- Tell students to leave their computers set up until judging is complete. Failure to do this will cause a team to forfeit their right to further questions on problems or judging.
- Have teams complete their Team Verification forms and turn them in to the room monitor.
- Complete judging.
- Complete scoring. The maximum possible programming score is 720. Ties are not broken. (Overall team ties are broken when both written exam and programming results are entered in the Spring Meet Online System).
- **VERIFICATION PERIOD:**
 - Allow a period of 15 minutes immediately following the contest for teams to ask questions.
 - Establish an orderly process for conducting verification that works efficiently for your number of teams and contest personnel (teams line up at the front of the room, remain in their seats and raise their hand, etc.).
 - The purpose of the verification is for teams to ask specific questions about specific problems where they believe they should have received credit. It is not a time for more general inquiries about how to solve a problem. It is important to keep the process moving so questions can be addressed and the contest can be concluded in timely fashion. Once the 15 minutes has elapsed, close verification and wrap up any questions that are in process.
 - At the discretion of the contest director, it is permissible to show teams how their program runs on the judging station with the judge test data.
 - DO NOT share with teams the sample solutions provided with the judging materials during verification. These samples are intended to be released to teams after the meet to provide an example of how each problem can be solved.
 - Before or during the verification period described above, also verify recorded scores with Team Verification forms and resolve any discrepancies.
- Following verification, collect all official contest materials. These may be returned to teams when other official district materials are returned.
- After required data entry procedures are completed, assemble coaches and contestants again and announce results.

Other Issues:

- **Acceptable Media:** The most common media format is the USB flash drive, which the majority of teams use for non-networked contests. For networked contests using PC², no media is needed, other than whatever is necessary for contest setup and distribution of data files.
- **Networked Contests:** Many contests have switched to a networked format using PC² software, including the UIL state contest and most regional contests. This approach is strongly encouraged for contest directors who are comfortable with the setup process. Go to <http://www.ecs.csus.edu/pc2> for additional information about PC², including documentation and software downloads. Additional information is available on the CS Resources page of the UIL website: <http://www.uiltexas.org/academics/computer-science/resources>.
- **Feedback:** Finally, your feedback is always welcome. If you have suggestions for ways to improve the district competition, please email to: **dtrussell@uiltexas.org**.

UIL Computer Science District Programming Contest – Director's Guide Addendum

Computer Rule Modification

For Spring 2021 contests, a temporary rule modification allows the option for teams to use more than one computer during competition. The intent of this modification is to allow districts flexibility to implement COVID-19 risk mitigation measures at their contest sites.

- The multiple computer rule modification is an option not a requirement. Districts may choose the multiple computer option or may choose a traditional format with one shared computer per team.
- Computer use options must be the same for all teams participating in the district contest.
- A multiple computer setup means one computer per team member, for a total of no more than three computers per team. Teams may have backup computers – these must be kept powered off and stored unless needed due to equipment failure.
- Regardless of computer setup, Computer Science Programming remains a team competition. Teams should collaborate and strategize in determining how to work through the packet.
- In a multiple computer setup, contest directors can determine submission procedures to best facilitate judging. Submission procedures should be clearly communicated to all teams prior to beginning the contest.

Thank you for your willingness to host the UIL Computer Science contest at the district level and for all of your hard work!