

PC² for UIL Hands-On Programming Contests

(Original document by John Owen, updated by Rich Brozovic for 2022)

SIX STEPS TO ACCOMPLISH BEFORE THE DAY OF THE CONTEST

1. **Wireless Router Network Support:** Prepare your router or make arrangements for support.
 - Detailed instructions are not provided due to the wide variety of routers and situations. However, ISD and university networks will probably block rogue routers so you must coordinate in advance with their IT support teams. Some host sites may create a special SSID for the contest that blocks Internet access and enables port 50002 for PC² access. **CONTACT HOST SITE NETWORKING SUPPORT EARLY!!**
2. **Install and Prepare PC² & Java:** Recommend at least two dedicated laptops for district and regional contests!
 - Download **pc2-9.7.0** from <https://pc2ccs.github.io/>.
 - Extract all files to desired location, recommend **C:** but it could be your desktop or documents folder. The extraction process creates a folder named **pc2-9.7.0**.
 - Update your **Java JDK** if needed, recommend latest **JDK** which can be downloaded from <https://www.oracle.com/java/technologies/java-se-glance.html>.
 - Update your **PATH** variable (user or system) through your advanced system settings:
 - Add the name of the **JDK bin** folder, perhaps **C:\Program Files\Java\jdk-17.0.2\bin**.
 - Add the name of the **PC² bin** folder perhaps, **C:\pc2-9.7.0\bin**.
 - You must be able to open a **Command Prompt** window and enter the commands: **java**, **javac**, and **pc2admin** (run **pc2admin.bat**). You should get help screens for the java and javac commands and nothing for the PC² command. Any messages about an unrecognized command means the path does not contain the correct folder name. Close and reopen the **Command Prompt** window after path updates.
 - Install alternate tool for judging team results:
 - Install the judging environment from the **UIL Contest CD** which creates folder **C:\UILProgramming**. Instructions are included in the contest package, just run **install.bat** on the CD.
 - Copy **C:\UILProgramming\CSDiff** to desired location on your judging host computer. Launch **CSDiff.exe** and accept the license and close the application. Instructions for using **CSDiff** are provided later.
3. **Update PC² Configuration File:**
 - The **pc2v9.ini** PC² configuration file is found in **C:\pc2-9.7.0** (or your location of zip extraction).
 - On the computer that will host the **PC² contest server**, use the console command **ipconfig** to obtain your **IPv4** address, something like 10.10.10.3 or 192.168.1.3.
 - Open **pc2v9.ini** in **Wordpad** and edit the line below “**# Site 1**”, replacing only “**localhost**” with the IP address of your PC² server’s host computer. The line must be something like “**server=10.10.10.3:50002**”.
 - If you will be using additional computers to serve as judging or scoreboard hosts, copy the updated file to the PC² working folders on those computers. “Working folders” will be explained in contest run details.
 - If you will be using an ISD or university network for the contest, you must generally obtain your IP address at the contest site and update the **ini** file for distribution to computers teams just before contest time.

SIX STEPS TO ACCOMPLISH BEFORE THE DAY OF THE CONTEST (continued)

4. **Prepare Flash Drives:** Used to distribute of files to teams.

- Copy the **Student Data Files** folder from the **UIL contest CD** to a convenient location on your computer. If necessary, copy **dryrun.dat** to this folder from the **DryRun** folder on the **UIL contest CD**.
- Copy the **C:\pc2-9.7.0** folder into that folder, in case students have not yet downloaded and extracted PC².
- Copy the updated **pc2v9.ini** file from the previous step into that folder, so teams do not have to go looking for it in the PC² bin folder. They will have to copy it into their working folder, e.g. **C:\UIL-Team**.
- Copy all files from your **Student Data Files** folder to flash drives to be distributed to the student teams at the contest site.

5. **Prepare PC² Contest Server:**

- Download the **PC2_Contest_2022.zip** file from the location provided by the State UIL Contest Team where *Contest* will be **InvA**, **InvB**, **District**, or **Region**.
- Unzip **PC2_Contest_2022.zip** to desired location where it will create a working folder named **UIL-Contest**. Suggest placing it in a convenient location such as **C:\UIL-Contest**. That folder will be your “working folder” for the server, administrator, and scoreboard. Recommend creating **C:\UIL-Judge** as a working folder for the PC² judge client.

6. **Run a DryRun Trial Contest Yourself!!**

- You can run the entire trial contest on a single computer from a single working folder but if you have multiple computers or will be using your own router it would be best to use a multi-host configuration. Multiple working folders will make it easier to find some items later during the contest and will distribute PC² logging across multiple folders.
- Create a working folder for the team client, e.g. **C:\UIL-Team99**. Team name **team99** with password **team99** should be reserved for contest director’s testing.
- Copy the **DryRun.java** code file from the **DryRun** folder on the **UIL contest CD** to a convenient location to test the team submission client during your trial contest.
- Details for launching and running the **DryRun** contest and the actual contest can be found in the next set of instructions for **THE DAY OF THE CONTEST**.

THE DAY OF THE CONTEST

1. Get to the host site and set up at least an hour early and check power and network access!
 - You will need access to email and the Internet on one computer to communicate with the State UIL Contest Team for Computer Science and perhaps with your local contest site team. Check email for contest updates that might require making copies of documents.
 - All contest computers, yours and all teams, must be connected to the same local wireless network which is normally blocked from Internet access.
 - If you had to wait until arriving at the contest site to obtain your server's IP address, see steps 3 and 4 above to finish preparing the flash drives to distribute files to student teams. Copy the updated **pc2v9.ini** to each flash drive as well as the computers you will be using for the contest.
 - Highly recommend at least two computers be dedicated to support the contest. One to host the server, administrator, and scoreboard clients and a second one to host the judging client. You can use the server's **C:\UIL-Contest** folder as the working folder for the administrator and scoreboard clients. Recommend creating a folder, e.g. **C:\UIL-Judge**, as the judge client working folder.
 - At this point, you should have the PC² client working folders created and the server unzipped from step 5 above during setup. The server is set up to initially launch the **DryRun** contest and a later step will switch it over to the actual contest.
2. **Launch DryRun Contest:** Verify teams have access and all components are operational!
 - All of the PC² components are launched via **Command Prompt** windows after changing the working directory to the desired folder, e.g. **cd \UIL-Contest** for the server, admin, and scoreboard clients.
 - Launch contest server: enter **pc2server** (run **pc2server.bat**) with **site1** as both name and password then **contest2022** as the contest password.
 - ALL non-team client passwords are: **contest2022**.
 - Launch contest administrator: enter **pc2admin** (run **pc2admin.bat**) with **administrator1** as name.
 - Launch scoreboard: enter **pc2board** (run **pc2board.bat**) with **scoreboard1** as name.
 - Launch judge: enter **pc2judge** (run **pc2judge.bat**) with **judge1** as name (or judge2, judge3 if using multiple judges).
 - Launch Teams: enter **pc2team** (run **pc2team.bat**) using assigned team name (e.g. **team99**) as both name and password.
 - Use server client and select **Run Contest** tab, then **Logins** sub-tab and verify all teams are connected.
 - Try to help teams resolve issues:
 - Are they connected to the correct wireless network?
 - Are they using a domain managed laptop without administrator rights to modify network settings?
 - Did they install and set up Java and PC², including updating system PATH variable?
 - Does their working folder contain **pc2v9.ini** with the correct IP address?
 - Are they entering the correct team name and password (they are the same)?

Run DryRun Contest continues on next page ...

THE DAY OF THE CONTEST (continued)

3. Run DryRun Contest:

- Use your admin client and select **Configure Contest** tab, then **Times** sub-tab, then click **Start ALL**.
- Teams use their client to select **Problem** and **Language** from drop-down lists, click **Select** to browse for and select Java code file, then click **Submit** then click **Yes**. After a short delay, they should receive a submission confirmation message and need to click **OK**. After another short delay, they should receive a preliminary judgement to which they click **OK** and after judging is complete they will receive a final judgement which requires another **OK**. Teams may also submit and view clarification requests.
- Use judge client to review and complete judging as submissions are received:
 - View the **New Runs** tab and double-click the top submission to display the validator's judgement.
 - If validator recommends **Yes**, click **Accept Validator**. **ALWAYS ACCEPT A YES!**
 - If validator recommends **NO** with an error indicator, **ALWAYS REVIEW A NO!** Click **Execute Run** then click **Compare** or **View** team output. **Close** viewing windows and return to the judgement screen. Generally, the validator gets it right and you click **Accept Validator**. If you select a different judgement result from the dropdown list, click the **Accept Selected** button.
 - Continue judging submissions as they are received until the **DryRun** period has expired.
 - Watch team submission success, not coding success, during the **DryRun** period:
 - Use your admin client and select **Run Contest** then **Runs** sub-tab to view all submissions which can be sorted by team number by clicking the **Team** column label.
 - All that is required to end the **DryRun** period is that all teams submit something, they do not have to submit a correct solution!
 - If a team cannot solve their network issues, they will have to make submissions via flash drive and you will have to launch a team client for each such team. If you have to use multiple team clients, use extreme care to use the correct one for each team!
 - **ALTERNATE JUDGING:** There may be situations where everything looks okay or there is too much output to fully view and **CSDiff** can be used to compare the team results to the official results.
 - Launch **CSDiff** on the judge's computer.
 - For the **Base revision**, select the official results which can be found on the judge's computer in the working folder (e.g. **C:\UIL-judge\executesite1judge1** with last digit being the current judge number). The official result is in the same folder with an "out" file that matches the problem name, e.g. **dryrun.out**.
 - For the **Compared revision**, select **teamoutput.0.txt** in the same folder as the base file.
 - Click **Options** and select **Detect all** and **By line** then click **OK** and **OK**.
 - Content that exists in the base but is missing from the team output will be **red-strikethrough**. Extra content that exists in the team output will be **blue**. Matching lines will be light grey.
 - If the output appears identical, look carefully for internal spacing issues and if there are none, change **Options** to **Smart detect** instead of **Detect all** and try again. Extra spacing at the end of a line or a missing final newline char are not considered errors and the solution is **ACCEPTABLE!** Override the automated judgement and select **Yes** from the dropdown list.
- Use your admin client and click **Stop ALL** to stop further submissions.
- **Exit** the scoreboard client and all judge clients and have all teams exit contest.

THE DAY OF THE CONTEST (continued)

4. Launch Actual Contest:

- Use your server client and click **Logins** tab to verify that all teams, judges, and scoreboard clients have exited the contest system! If necessary, select non-administrator login lines and click **Logoff**.
- Use your admin client to switch over from DryRun to actual contest.
 - Click **Configure Contest** tab then **Profiles** subtab.
 - Select the profile (perhaps District_2022) below the “active” line and click **Switch**, click **Yes** then enter password **contest2022**. Client will display the new active profile a few moments later.
 - Relaunch the scoreboard and judges.
 - Direct teams to relaunch their client.
 - Use your server client and click **Logins** to view connection status and make sure all teams reconnect.

5. Run Actual Contest:

- Use your admin client and click **Times** subtab. When ready, click **Start ALL**.
- Use judging process described in step 3 above of **Run the DryRun Contest**, to judge submissions as they arrive.
- Scoreboard client displays current scores sorted high to low during the contest.
- See special instructions below for handling **Clarification Requests** from teams.
- Allow contest to automatically stop when time expires.
- Teams can view their results using their client and selecting **View Runs** to complete the team verification document with numbers of both **YES** and **NO** submissions. Click the Problem column label to sort the list in order of problem names.
- After the verification period, **Exit** all judge clients and have all teams exit contest.

6. Clarification Requests:

- Use either any judge client or the admin client to answer requests.
- The judge client has two tabs **New Clars**, to respond to unanswered clarifications, and **All clarifications**, to view past clarifications.
 - Double-click the top clarification and enter answer as desired or click the **Default Answer** button to send the message: **No response, read problem statement**. If the question and answer is about an issue with one of the problems and should be shared with all teams, click the **Send to ALL teams** checkbox then click **Ok**.
 - You may copy answers from previous requests and paste them in the answer box as a way to provide consistent responses.
 - The **Generate clarification** subtab is primarily used in contests where the administrator and judges may be physically separated which is not common in UIL contests.
- The admin client has a **Clarification** subtab under the **Run Contest** tab and can perform the same operations as judges.

Contest Verification & Final Report from Actual Contest continues on next page ...

7. Contest Verification & Final Report from Actual Contest:

- Leave server, admin, and scoreboard clients running until you verify the contest results and produce your final reports. Once a team disconnects from contest system, they can no longer dispute results!
- Scoreboard client displays final totals after the contest.
- Admin client can use features from the **Run Contest** tab to view additional details about scores:
 - Use **Standings** sub-tab to display same info as **Scoreboard** and the **Standings HTML** is the same report in a different format.
 - Use **Reports** sub-tab to select **Runs grouped by team** from the dropdown list and click **View Report**. This report provides run details, including both Yes and No runs, for each contest problem listed by team.
 - **Reports** sub-tab, **Solutions By Problem** might be interesting to the problem writing team.
- One more report option that could be useful at the END OF THE CONTEST!
 - Do not use this process unless contest is stopped.
 - Using admin client, select **Configure Contest** then sub-tab **Problems**. Select **DryRun** and click **Edit**. Uncheck **Hide Problem** checkbox and click **Update**. It may take a few moments to take effect.
 - Open **Windows Explorer** and navigate to your server working folder, e.g. **C:\UIL-Contest**.
 - Copy the file **pc2v9ScoreBoard2018Owen.jar** into the **html** folder, if you used **C:\UIL-Contest** as the working folder for the scoreboard. Or, copy it into the **html** subfolder of the scoreboard working folder, e.g. **C:\UIL-Board\html**.
 - If your computer is configured to run **Java jar** files via a double-click, navigate **Windows Explorer** to the **html** folder and double-click the **jar** file. The program will create two new files containing final score data: **UILScoreCardV9_2018.html** and **UILTeamScoreCardV9_2018.html**. Simply double-click each file to view it in a browser tab.
 - If you are unable to run the **Java jar** using the previous step, open a **Command Prompt** and change directory to the **html** folder, e.g. **cd \UIL-Server\html** or **cd \UIL-Board\html** and execute the command **java -jar pc2v9ScoreBoard2018Owen.jar**, then view the files.
 - Teams will be listed in descending order of scores with ties broken by team number and each problem across the team's line will have one of the following:
 - C with no following digit means the problem received the full 60-point score.
 - C followed by a digit such as C2 means problem was successfully completed but the digit indicates the number of "No's". Score will be $60 - 5 * \text{digit}$.
 - dx where **d** is a digit like 2x means problem was submitted **d** times but never with a "Yes" and earns 0 points.
 - Blank means problem was never submitted and earns 0 points.

TAKE A DEEP BREATH ...

SHUT DOWN AND PACK UP ALL EQUIPMENT ...

GO HOME, JOB WELL DONE!