CODING

OVERVIEW

Applying leadership and 21st century skills, participants respond to an annual coding-related design challenge by developing a software program that will accurately address an onsite problem in a specified, limited amount of time. Specific elements to be used, such as the programming language, operating system, or application programming interface (API), will be released onsite. Every effort will be made to support a wide variety of programming languages, and the specific languages, which will be posted on the TSA website under Competitions/Themes and Problems. Completed solutions are objectively measured to determine the best and most effective solution for the stated problem.

ELIGIBILITY

One (1) team of two (2) individuals per chapter may participate; individual entries are permitted.

TIME LIMITS

A. Up to two (2) hours is allowed for the design and construction of the solution.

B. Performance Time: Due to space limitations, judging may occur in rounds.

ATTIRE

TSA competition attire is required for this event.

PROCEDURE

A. Participants bring their own computer systems to the event area at the time and place stated in the conference program.

B. Participants are given a problem, evaluation criteria, materials, and allotted two (2) hours for the design and construction of the solution.

C. Each solution is tested and presented to the judges as soon as possible after the coding phase is completed.

D. The top ten (10) finalists are announced at the awards ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

A. The specific languages permitted in the on-site competition are posted each year on the TSA website under Competitions/Themes and Problems.

B. All work must be completed in the event area during the time specified for the event.

C. Individual participants, or each team, must bring

   1. one (1) laptop or other device (ex: Microsoft Surface Pro), capable of networking via Wi-Fi, and running solely on battery power for up to two (2) consecutive hours
   2. one (1) spare battery
   3. pencils and paper

D. External keyboards, monitors, and mice are not permitted.

E. Printed reference materials are not allowed.

F. Participants do NOT have access to the Internet during the event.

G. Participants do NOT have access to electrical power/outlets during the event.

H. Participants must have all software development tools needed for the competition downloaded and accessible on their laptop or other device.

I. Participants may only use the permissible programming language's standard library during the on-site competition. No third-party libraries may be used.

J. Participants are presented with a series of coding problems that must be completed on-site at the conference.

K. All solutions must be tested, demonstrated, and presented by participants in front of the judges exclusively through electronic submission and evaluation.

EVALUATION

A. The successful completion of the problems and the time in which it takes individuals or teams to complete all the challenges.

B. A finite measure is defined in the problem and is used to determine the best solution.

   1. Second-best attempts or other objective criteria are used to break ties when possible.
   2. Only as a last resort is subjective criteria, such as originality, used to evaluate solutions.

Refer to the official rating form for more information.

RESOURCES

The USA Computing Olympiad website and the ACM-ICPC International website are helpful resources for the Coding event. Additional resources that can be used to prepare for the event are listed below:

icpc.baylor.edu/compete/preparation

www.codechef.com

www.usaco.org/index.php?page=contests

blog.hackerearth.com/2013/09/competitive-programming-getting-started_11.html

www.quora.com/What-is-the-best-strategy-to-improve-my-skills-in-competitive-programming-in-2-3-months

STEM INTEGRATION

Depending upon the subject of the problem, this event may align with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILL DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Computer software engineer
- Mathematician

Participant/Team ID# _____

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2021 & 2022 OFFICIAL RATING FORM

HIGH SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

☐ Computer hardware is present
☐ ENTRY NOT EVALUATED

SOLUTION DEVELOPMENT (30 points)

CRITERIA	Minimal performance 1-4 points	Adequate performance 5-8 points	Exemplary performance 9-10 points	Record scores in the column spaces below.
Code Quality (X1)	The logic of the code cannot be followed or is difficult to follow; no comments or very few comments are present in the code.	The logic of the code is sometimes easy to follow by reading through submitted source files; some comments are present, but comments are not always present where necessary.	The logic of the code is easy to follow by reading through the submitted source files; sections where logic may be unavoidably difficult to follow are commented appropriately.	
Use of Standard Libraries (X1)	The solutions do not appropriately use standard libraries for the language in which they are written; solutions attempt to use or import third party libraries	The solutions attempt to use standard libraries available or sometimes use standard libraries available for the language in which they are written.	The solutions make appropriate use of the standard libraries available for the language in which they are written; no attempt is made to use or import a third-party library.	
Subjective Criteria (X1)	Team did not work well together, did not understand the solution, and did not demonstrate an understanding of coding practices; leadership and/or 21st century skills are not evident.	Team worked reasonably well together; team demonstrates an adequate understanding of the problem solutions and of coding practices; leadership and/or 21st century skills are somewhat evident.	Team works well together and demonstrates superior understanding of the solution and of coding practice; leadership and/or 21st century skills are clearly evident.	
			SOLUTION DEVELOPMENT SUBTOTAL (30 points)	

TESTING OF SOLUTION (80 points)

Evaluation: A finite unit of measure, such as elapsed time, linear distance, and/or strength, etc., is used to determine ranking.

1st: 80 Points	**2nd:** 75 Points	**3rd:** 70 Points	**4th**: 65 Points	**5th:** 60 Points	**6th:** 55 Points	**7th:** 50 Points	**8th:** 45 Points
9th: 40 Points	**10th:** 35 Points	**11th:** 30 Points	**12th:** 25 Points	**13th:** 20 Points	**14th:** 15 Points	**15th:** 10 Points	**16th:** 5 Points

TESTING OF SOLUTION SUBTOTAL (80 points)

CODING

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right. Indicate the rule violated: _____	
SOLUTION SUBTOTAL (110 points)	
To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary. **TOTAL** (110 points)	

Comments:

I certify these results to be true and accurate to the best of my knowledge.

JUDGE

Printed name: _____ Signature: _____

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EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

A. Event coordinator

B. Judges, two (2) or more

C. Assistants for set-up, monitoring, and clean-up of on-site activity, two (2) or more

MATERIALS

A. Coordinator's packet, containing:

   1. Event guidelines, one (1) copy for the coordinator and for each judge
   2. TSA Event Coordinator Report
   3. List of judges/assistants
   4. Results envelope with coordinator forms

B. Projector

C. White board or wall for projecting the images

D. Tables and chairs for participants

E. Tables and chairs for judges, to be used for information distribution and evaluation

F. A copy of a well-written, technologically appropriate problem for each participant/team that can be objectively measured

G. Adequate conditions, tools, materials, monitoring, and testing devices for the problem

RESPONSIBILITIES

AT THE CONFERENCE

A. Attend the mandatory coordinator's meeting at the designated time and location.

B. Report to the CRC room and check the contents of the coordinator's packet.

C. Review the event guidelines and check to see that enough personnel have been scheduled.

D. Inspect the area(s) in which the event is to be held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.

E. At least one (1) hour before the event is to begin, meet with judges to review time limits, procedures, regulations, evaluation, and all other details pertaining to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

ON-SITE CODING CHALLENGE

A. Begin the event at the scheduled time by closing the doors and checking the entry list.

B. All participants and judges should be in the room at this time.

C. Late participants and/or entries are considered on a case-by-case basis and only when lateness is caused by events beyond participant control.

D. In order to compete, participants must be on the entry list or must have approval of the CRC.

E. Check in the semifinalist teams and equipment. Participants must bring:

   1. One (1) laptop
   2. Extra charged laptop battery or extra charged laptop as backup (but only one laptop may be used at any time)
   3. One (1) computer mouse
   4. Teams may also bring pencils and paper.

F. Teams do NOT have access to electrical power/outlets during the event.

G. Teams do NOT have access to the Internet during the event.

H. Students must have all software development tools needed for the competition downloaded and accessible on their computers.

I. Once teams are seated and general announcements have been given, distribute and review the problem and start the time.

J. All solutions must be tested, demonstrated and presented by participants in front of the judges. Judges and assistants observe, with judges evaluating solutions as soon as appropriate.

K. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and CRC manager to determine either:

   1. To deduct twenty percent (20%) of the total possible points in this round or
   2. To disqualify the entry

   The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.

L. Judges determine the ten (10) finalists and discuss and break any ties.

M. Submit the finalist results and all related forms in the results envelope to the CRC room.

N. If necessary, manage security and the removal of materials from the area.