# SOFTWARE DEVELOPMENT

## OVERVIEW

Using leadership and 21st century skills, participants apply knowledge of cutting-edge technologies and algorithms to design, implement, test, and document a software development project. The project should have educational or social value. The theme of the current year's software development project will be posted on the TSA website under *Themes & Problems*.

## ELIGIBILITY

One (1) team per chapter may participate. The presentation/interview is limited to three (3) members.

## TIME LIMITS

A. A copy of the solution's code for the chapter's entry (URL or PDF) must be finished, submitted, and accessible via the Internet by 11:59pm ET on a designated date mid-May.

B. Up to seven (7) minutes for the presentation, and an additional three (3) minutes to respond to questions (i.e., interview).

## ATTIRE

TSA competition attire is required for this event.

## PROCEDURE

### PRE-CONFERENCE

A. Participants review the TSA Honor Statement for Competitive Events found in the General Rules and listed in the individual competitive event rules.

B. Participants identify a societal need based on the yearly theme and design a tool (e.g., graphical user interface, dashboard, predictive model, etc.) using software of choice that addresses this need.

C. Participants prepare for a live presentation/interview on-site.

### PRELIMINARY ROUND

A. Participants report to the event area at the time and place stated in the conference program to sign up for a presentation/interview time.

B. Participants report at the assigned time and place for their presentation/interview.

C. Participants give a live presentation of the functionality of their project, describe the design process, and discuss the value of the project.

D. Judges will ask at least one question about the project code that participants will need to answer.

E. Participants remove their project and equipment from the area at the completion of the presentation/interview.

F. Judges evaluate the presentation and interview.

G. A list of twelve (12) semifinalist teams (in random order) is posted.

### SEMIFINAL ROUND

A. Semifinalists report to the event area at the time and place stated in the conference program to receive an assigned presentation/interview time.

B. Semifinalist presentation/interviews follow the same procedure as in the preliminary round.

C. Ten (10) finalists will be announced during the conference 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.

### PRE-CONFERENCE

A. Participants must submit their executable raw code online by 11:59pm ET on a designated date mid-May.

B. The code must be submitted as a URL leading the judges to either an online repository (i.e. GitHub) or a link to a PDF of all of their code.

### PRELIMINARY ROUND

A. Participants report at the time and place stated in the conference program to sign up for a presentation/interview time.

B. Participants report at the assigned time and place for the presentation/interview.
C. Participants must provide all necessary hardware to demonstrate their project during the presentation.
    1. This may include a laptop computer (operating solely on battery power) with a computer mouse (if desired) or mobile device(s).
    2. The set-up should not exceed 2' x 2' x 2'.
D. National TSA will NOT provide wireless Internet. Students may provide internet access using a hotspot from a mobile device, however, students should have an alternate presentation plan in case access is unavailable.
E. A list of twelve (12) semifinalists (in random order) is posted.

### SEMIFINAL ROUND

A. Participants report at the time and place stated in the conference program to sign up for a presentation/interview time.
B. Participants report at the assigned time and place for the presentation/interview.
C. The semifinal round will follow all rules and guidelines of the preliminary round.
D. Judges evaluate the presentation/interview.
E. The top ten (10) finalists are announced at the awards ceremony.

## EVALUATION

### PRELIMINARY ROUND

A. The quality of work
B. The overall benefit of the work
C. The technical skill exhibited in the project
D. The ability to demonstrate and describe the team's software design process
E. How well the problem identified is solved by the tool demonstration and relates to the theme
F. The ability to explain portion of their code in the project questioned by the judges.
G. Teams are judged on the functionality and originality of their project. At a minimum, presentations should include:
    1. the design process
    2. end-user applications
    3. a demonstration
    4. information on the design

Refer to the official rating form for more information.

## TSA HONOR STATEMENT

All work must be created and completed by individual competitors or teams. Plagiarism, the use of Generative Artificial Intelligence (GenAI) software, copyright violation, cheating, and falsification of information are prohibited. Participants may NOT use any generative artificial intelligence (GenAI) tools (e.g. ChatGPT, Google Gemini, GitHub Copilot, etc.). Any attempt to gain an unfair advantage will not be tolerated. Competitors at any level of TSA competition understand and agree to abide by the TSA Honor Statement.

If it is determined that a student violated the TSA Honor Statement, a rules violation of twenty percent (20%) will be incurred.

## STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

## LEADERSHIP AND 21ST CENTURY SKILLS

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, and Flexibility/Adaptability

## CAREERS RELATED TO THIS EVENT

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

- Graphic designer
- Software engineer

Participant/Team ID# _____

# SOFTWARE DEVELOPMENT

## 2025 & 2026 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

| **PROJECT SOLUTION** (70 points) | | | | |
|---|---|---|---|---|
| **CRITERIA** | Minimal performance | Adequate performance | Exemplary performance | Record scores in the column spaces below. |
| | 1-4 points | 5-8 points | 9-10 points | |
| **Creativity** (X2) | The project lacks creativity surrounding the current yearly theme with little original thought in developing the project. | Some elements of the project express creativity surrounding the current yearly theme and/or the solution is somewhat original. | The project exudes creativity and originality surround the current yearly theme. | |
| **Software Coding Practices** (X2) | The project is inadequately developed in terms of general software coding practices (requirements, design, implementation, and testing). | The project is developed following most general software coding practices (requirements, design, implementation, and testing). | The project is extremely well developed and follows general software coding practices (requirements, design, implementation and testing). | |
| **Complexity** (X2) | The software design exhibits little complexity. | The software design exhibits some degree of complexity. | The software design is complex, resulting in a highly functional product. | |
| **Technical Skill** (X1) | Little technical skill is exhibited in the software; the levels of software development are not fluid and/or are illogical. | Average technical skill is exhibited in the software's design and construction; the software flows somewhat effectively from level to level. | The software exhibits mastery of software design skill that few at this level possess; the software flow is constant and logical. | |
| | | | **PROJECT SOLUTION SUBTOTAL** (70 points) | |

| PRESENTATION/INTERVIEW (60 points) | | | | Record scores in the column spaces below. |
|---|---|---|---|---|
| **CRITERIA** | Minimal performance | Adequate performance | Exemplary performance | |
| | 1-4 points | 5-8 points | 9-10 points | |
| **Organization and Knowledge** (X1) | The team seems unprepared and unorganized for the presentation and questions from judges; team members have very little understanding of the concepts in their project, and provide vague answers to judges' questions. | The team is preparedfor the presentation and answers questions adequately; all team members have a general understanding of the concepts discussed and answer questions adequately. | The team's presentation is logical, organized, and effective; the team answers questions logically, thoughtfully, and with confidence; there is clear evidence that all team members have a thorough understanding of the concepts presented in their project. | |
| **Articulation** (X1) | Communication of the solution is unclear, unorganized, and or illogical; leadership and/or 21st century skills are not evident. | Communication of the solution is somewhat logical and clear; leadership and/or 21st century skills are somewhat evident. | The demonstration provides a clear, concise, and easy-to-follow analysis of the solution; leadership and/or 21st century skills are clearly evident. | |
| **Team Participation** (X1) | Only one (1) team member communicates with judges; there is no participation from other team members. | Team members participate generally equally and adequately understand the concepts of the project. | All team members fully understand the concepts of the project and share an equal role in answering judges' questions. | |
| **Coding Explanation** (X3) | The team barely or does not answer or explain the purpose and construction of the code the judges chose from the code submitted. | The team partially answers and/or partially explains the purpose and construction of the coding section that the judges chose from the code submitted. | The team answers and explains the purpose and construction of the coding section that the judges chose from the code submitted. | |
| | | | **PRESENTATION/INTERVIEW SUBTOTAL** (60 points) | |

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: _____

**To arrive at the TOTAL score, subtract rules violation points, as necessary.** **TOTAL** (130 points)

Comments:

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

JUDGE

Printed name: _____ Signature: _____

# SOFTWARE DEVELOPMENT
# EVENT COORDINATOR INSTRUCTIONS

## PERSONNEL

A. Event coordinator

B. Judges:

   1. Preliminary round, two (2) or more
   2. Semifinal round, 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

B. Chairs, as needed for judging

C. Stopwatch for timing presentation/interviews

D. Measuring tape

## 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 being 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 scheduled to begin, meet with judges/assistants to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

F. Ensure the judges have access to the online judging system.

### PRELIMINARY ROUND

A. Participants report at the time and place stated in the conference program to sign up for a presentation time.

B. If check-in is on the first day of the conference, requirements for attire do NOT apply during check-in.

C. No more than three (3) participants report at the assigned time and place for the presentation.

D. Late entries are considered on a case-by-case basis and only when the delay is caused by events beyond participant control.

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

F. Judges assess the presentations and may ask questions.

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

   1. To deduct twenty (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.

H. Judges independently evaluate the presentation/interview.

### SEMIFINAL ROUND

A. Using the same official rating form for the semifinalist, judges asses the semifinalist presentation and determine the ten (10) finalists.

B. Discuss rule violations (e.g. 20% deduction, disqualification) and have all relevant parties initial the rating form.

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