AP COMPUTER SCIENCE PRINCIPLES

Student Handouts

Effective
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Create Performance Task

Programming is a collaborative and creative process that brings ideas to life through the development of software. In the Create performance task, you will design and implement a program that might solve a problem, enable innovation, explore personal interests, or express creativity. Your submission must include the elements listed in the Submission Requirements section below.

You are allowed to collaborate with your partner(s) on the development of the program only. **The video and Personalized Project Reference that you submit for this performance task must be completed individually, without any collaboration with your partner(s) or anyone else.** You can develop the code segments used in your **Personalized Project Reference** with your partner(s) or on your own as you work on the performance task during class.

Please note that once your teacher has assigned this performance task as one of your AP score components, you are expected to complete the task without assistance from anyone except for your partner(s) and then only when developing the program code. You must follow the Guidelines for Completing the Create Performance Task section below.

General Requirements

You will be provided with a minimum of 9 hours of class time to complete and submit the following:

- **Final program code** (created independently or collaboratively)
- **A video that displays the running of your program and demonstrates functionality you developed** (created independently)
- **Code Segments for your Personalized Project Reference** (created independently)

Note: Students in nontraditional classroom environments should consult a school-based AP Coordinator for instructions.

Submission Requirements

COMPONENT A: PROGRAM CODE (CREATED INDEPENDENTLY OR COLLABORATIVELY)

Submit one PDF file that contains all of your program code (including comments). Include comments or acknowledgments for any part of the submitted program code that has been written by someone other than you and/or your collaborative partner(s).

IMPORTANT:

If the programming environment allows you to include comments, this is the preferred way to acknowledge and give credit to another author. However, if the programming environment does not allow you to include comments, you can add them in a document editor when you capture your program code for submission.

In your program, you must include student-developed program code that contains the following:

- ☐ Instructions for input from one of the following:
  - the user (including user actions that trigger events)
  - a device
  - an online data stream
  - a file
- ☐ Use of at least one **list** (or other **collection type**) to represent a collection of data that is stored and used to manage program complexity and help fulfill the program's purpose

IMPORTANT:

The data abstraction must make the program easier to develop (alternatives would be more complex) or easier to maintain (future changes to the size of the list would otherwise require significant modifications to the program code).

- ☐ At least one procedure that contributes to the program's intended purpose, where you have defined:
  - the procedure's name
  - the return type (if necessary)
  - one or more parameters

IMPORTANT:

Implementation of built-in or existing procedures or language structures, such as event handlers or main methods, are not considered student-developed.

- ☐ An algorithm that includes sequencing, selection, and iteration that is in the body of the selected procedure
- ☐ Calls to your student-developed procedure
- ☐ Instructions for output (tactile, audible, visual, or textual) based on input and program functionality

DEFINITION:

List

A **list** is an ordered sequence of elements. The use of lists allows multiple related items to be represented using a single variable. Lists may be referred to by different names, such as **arrays**, depending on the programming language.

DEFINITION:

Collection Type

A **collection type** is a type that aggregates elements in a single structure. Some examples include lists, databases, and sets.

IMPORTANT:

With text-based program code, you can use the print command to save your program code as a PDF file, or you can copy and paste your code to a text document and then convert it into a PDF file. With block-based program code, you can create screen captures that include only your program code, paste these images into a document, and then convert that document to a PDF. Screen captures should not be blurry, and text should be at least 10 pt font size.

COMPONENT B: VIDEO (CREATED INDEPENDENTLY) Submit one video file that demonstrates the running of your program as described below. Collaboration is not allowed during the development of your video.

Your video must demonstrate your program running, including:

- ☐ Input to your program
- ☐ At least one aspect of the functionality of your program
- ☐ Output produced by your program

Your video may NOT contain:

- ☐ Any distinguishing information about yourself
- ☐ Voice narration (though text captions are encouraged)

Your video must be:

- ☐ Either .webm, .mp4, .wmv, .avi, or .mov format
- ☐ No more than 1 minute in length
- ☐ No more than 30MB in file size

COMPONENT C: PERSONALIZED PROJECT REFERENCE (CREATED INDEPENDENTLY) To assist in responding to the written response prompts on exam day, submit required portions of your code by capturing and pasting program code segments you developed during the administration of this task. Screen captures should not be blurry, and text should be at least 10-point font size. Your code segments should not include any comments. These code segments will be made available to you on exam day only if this component is submitted as final in the AP Digital Portfolio by the deadline.

Procedure: Capture and paste two program code segments you developed during the administration of this task that contain a student-developed procedure that implements an algorithm used in your program and a call to that procedure.

IMPORTANT:

Built-in or existing procedures and language structures, such as event handlers and main methods, are not considered student-developed.

i. The first program code segment must be a student-developed procedure that:

- ☐ Defines the procedure’s name and return type (if necessary)
- ☐ Contains and uses one or more parameters that have an effect on the functionality of the procedure
- ☐ Implements an algorithm that includes sequencing, selection, and iteration

ii. The second program code segment must show where your student-developed procedure is being called in your program.

List: Capture and paste two program code segments you developed during the administration of this task that contain a list (or other collection type) being used to manage complexity in your program.

i. The first program code segment must show how data have been stored in the list.

ii. The second program code segment must show the data in the same list being used, such as creating new data from the existing data or accessing multiple elements in the list, as part of fulfilling the program's purpose.

DEFINITION:

List

A **list** is an ordered sequence of elements. The use of lists allows multiple related items to be represented using a single variable. Lists may be referred to by different names, such as **arrays**, depending on the programming language.

DEFINITION:

Collection Type

A **collection type** is a type that aggregates elements in a single structure. Some examples include lists, databases, and sets.

IMPORTANT:

The data abstraction manages complexity by making the program easier to develop (alternatives would be more complex) or easier to maintain (future changes to the size of the list would otherwise require significant modifications to the program code).

Guidelines for Completing the Performance Task

Academic Integrity and Plagiarism Policy

This policy addresses plagiarism and academic integrity in completing the Create Performance Task.

Plagiarism

The use of program code, media (e.g., video, images, sound), data, information, or evidence created by someone else or with generative AI tools in the creation of a program and/or a program code segment(s), without appropriate acknowledgment (i.e., through citation, through attribution, and/or by reference), is considered **plagiarism**. A student who commits plagiarism will receive a score of 0 on the Create performance task, including their responses to the written response prompts on the end-of-course AP Exam.

To the best of their ability, teachers will ensure that students understand how to ethically incorporate ideas that are not their own and provide credit to the original creator or source, as well as the consequences of plagiarism.

Acceptable Generative AI Use

Students are permitted to utilize generative AI tools as supplementary resources for understanding coding principles, assisting in code development, and debugging. This responsible use aligns with current guidelines for peer collaboration on developing code.

Students should be aware that generative AI tools can produce incomplete code, code that creates or introduces biases, code with errors, inefficiencies in how the code executes, or code complexities that make it difficult to understand and therefore explain the code. It is the student's responsibility to review and understand any code co-written with AI tools, ensuring its functionality. Additionally, students must be prepared to explain their code in detail, as required on the end-of-course AP Exam.

Preparing for Final Submission

Students are not permitted to collaborate on the video or creation of the Personalized Project Reference.

The Personalized Project Reference cannot include course content or comments within the code or on any other part of the reference. Including course content or comments in the Personalized Project Reference will result in students receiving a score of 0 on the Create performance task, including their responses to the written response prompts on the end-of-course AP Exam.

Attestations

During the final submission process in the AP Digital Portfolio, students will be asked to attest that they have followed the Performance Task guidelines and have not plagiarized their submission. Each of the three components of the Create performance task must be submitted as final to be sent for scoring. Additionally, if students do not submit their Personalized Project Reference by the deadline, they will not have this resource available on exam day to complete their written response section.

Preparing for the Performance Task

Prior to beginning the performance task, you ***should****:*

- Obtain content knowledge and skills that will help you succeed on the performance task. This can include, but needs not be limited to, the iterative development process, strategies for collaboration, the development of both data and procedural abstractions, describing an algorithm's purpose and explaining how it functions, and identifying test data that demonstrates the different outcomes of an algorithm. A development process includes exploration, investigation, reflection, design, implementation, and testing your program.
- Review the performance task directions and guidelines.
- Brainstorm problems that programming can address, or brainstorm special interests that programming can help develop.
- As needed, seek assistance from your teacher or AP Coordinator on defining your focus and choice of topics.
- Be prepared to collaborate with peers as necessary.
- Practice and discuss all or part of the performance task, including potential written response prompts that could appear on the end-of-course AP Exam.
- Review the role your teacher can and cannot play in providing assistance during the actual performance task, and take advantage of the opportunity to get assistance and feedback from your teacher during practice.
- Ensure you know the proper way to cite media or program code, including APIs or other pieces of open-source code, used in the creation of your program. Any media or program code that has not been written by you must be cited, and credit must be given to the author. Any existing program code needs to be extended in some new way by adding new functionality.
- Examples of responses can be found on the **AP Computer Science Principles Exam page**. You cannot submit any work from AP Central samples, curriculum provider samples, or practice performance tasks for your final submission.
- Be aware that the scoring process that occurs in the AP Reading may be different from the scoring process that occurs in your classroom; the AP score that you receive may be different than your classroom grade.
- Read through the **AP Digital Portfolio file submission requirements** and process, paying attention to the instructions concerning the file type, size, and length to be uploaded. This is important to ensure that work is sent for AP scoring. This process includes:
    - uploading your files to the correct part of the task
    - submitting each component as final
    - completing the College Board attestations to the originality of your work

  All three components must be submitted as final by the deadline posted on AP Central. Only files that are submitted as final will be sent for scoring. Additionally, if you do not submit your Personalized Project Reference by the deadline, you will not have this resource available on exam day to complete your written response section.

- Practice creating a video of your program running, while adhering to file type, size, and length requirements.
- Practice making readable screen captures and creating a PDF file of your program code to submit for the performance task:
  - With text-based program code, you can use the print command to save your program code as a PDF file, or you can copy and paste your code to a text document and then convert it into a PDF file.
  - With block-based program code, you can create screen captures that include only your program code, paste these images into a document, and then convert that document to a PDF file. Screen captures should not be blurry, and text should be at least 10 pt font size.
  - For the Personalized Project Reference, screen captures should not be blurry, and text should be at least 10 pt font size. Any course content or comments that were included with the program code, should not be included in the screen captures used in the Personalized Project Reference. Including course content or comments in the Personalized Project Reference could result in students receiving a 0 for the Create performance task.
- Understand that you may not revise your work once you have submitted it as final to the AP Digital Portfolio.
- Review the categories for each written response prompts on the end-of-course AP Exam. The written response prompts will be related to your Create performance task. Practice writing responses for these types of questions.

Completing the Performance Task

You ***must:***

- Submit all three components of your performance task as final prior to the submission deadline, which can be found on the AP Computer Science Principles Exam page on AP Central. Only files submitted as final will be sent for scoring. If you do not submit your Personalized Project Reference by the deadline, you will not have this resource available on exam day to complete your written response section.
- Follow a calendar or schedule that provides time for all performance task components to be completed and uploaded in advance of the deadline.
- Read the performance task directions.
- Apply the computer science knowledge you have obtained throughout the course, and when completing the performance task.
- Use acceptable acknowledgment practices when using program code, media (i.e., images, videos, sound), or data sources created by others or with generative AI tools in your program code to avoid plagiarism. Program code not written by you could include starter code provided by your teacher, the use of APIs or open-source code, or generated using an AI tool. When using existing code, you must extend the program in some new way by adding new functionality. Some examples of ways to provide attribution for program code that was not authored by you are as follows:
    - If the program code has been made available for your use by your teacher, add a comment that states: *This code was provided as starter code by my teacher*.
    - If the program code has been made available through an API or open-source code, add a comment that states: *This code was made freely available by [source of code]*.
    - If the program code has been co-created with the assistance of a generative AI tool, add a comment that states: *This code was generated using [Generative AI Tool Name]*.
- Add comments to your program code to clarify the functionality of program code segments or to acknowledge and credit authors of media, data sources, or program code:
    - If the programming environment allows you to include comments, this is the preferred way to acknowledge and give credit to another author.
    - If the programming environment does not allow you to include comments, you can add them in a document editor when you capture your program code for submission.

*Once you have started your official administration of the performance task, you **may not**:*

- Seek assistance in writing, revising, amending, or correcting your work, including debugging the program, writing or designing functionality in the program, testing the program, or making revisions to the program, from anyone other than your collaborative partner(s).
- Submit practice performance tasks or any work that has been revised, amended, or corrected by another individual, other than your collaborative partner(s) or cited program code, as a submission for AP Exam scoring.
- Include any course content in the screen captures of the program code included in the Personalized Project Reference. Any course content or comments that were included in the program code during the development of your program should be removed prior to taking screen captures. Including course content or comments in your screen captures will result in the written response portion of your exam being scored a 0.
- Collaborate during the creation of your video or creation of your Personalized Project Reference.
- Revise your work once you have completed and submitted it as final to the AP Digital Portfolio.

*Once you have started your official administration of the performance task, you **may**:*

- Collaborate with your partner(s) only during the ideation and development, including debugging and error testing, of your program code, if you choose to do so. NOTE: You are not allowed to collaborate on your video or creation of your Personalized Project Reference.
- Follow a timeline and schedule for completing the performance task.
- Seek assistance from your teacher or AP Coordinator on the formation of groups and resolution of collaboration issues when one collaborative partner is clearly and directly impeding the completion of the performance task.
- Seek clarification from your teacher or AP Coordinator on the program requirements and submission requirements for the performance task when you do not understand the directions.
- Work on the performance task outside of designated class time.
- Seek assistance from your teacher or AP Coordinator to resolve technical problems that impede work, such as a failing workstation or difficulty with access to networks, or to help with saving files or making movie files.
- Keep a programming journal of the design choices that were made during the development of the program code or code segment and the effect of these decisions on the program's function.