AP® COMPUTER SCIENCE PRINCIPLES
2016 SCORING COMMENTARY

Performance Task
Create — Applications From Ideas

Sample Response A

Rubric Row	Content Area	Score
1	Developing a Program with a Purpose	High
2	Developing a Program with a Purpose	High
3	Applying Algorithms	High
4	Applying Abstraction	High

Developing a Program with a Purpose - Row 1
The response earned a high score for this row because the response shows the running of at least one feature of the program that illustrates the program's intended purpose as described in the written response, which is to play a choose-your-own adventure game.

Developing a Program with a Purpose - Row 2
The response earned a high score for this row because it describes how two difficulties were resolved and incorporated. One difficulty was to be able to change the number of buttons and the text on them every time the user made a decision and was resolved independently by writing code that created a new frame at each step. Another difficulty was updating the HP bar properly and was resolved independently by creating functions to increase and decrease the amount of HP.

Applying Algorithms - Row 3
The response earned a high score because it provides code segments that identify a main algorithm (`def fight_beasts()`) with integrated mathematical/logical concepts and also identifies two integrated algorithms (`(schrodinger() and buttons(frame)`). The response explains the purpose of the algorithm which is to conduct battles in the game with characters called "beasts". The response accurately describes how each of the integrated algorithms function independently (`schrodinger()`, which helps determine the health of a player, and `buttons(frame)` which resets the frames in the game. An accurate explanation of how the algorithm (integrated with `schrodinger() and buttons(frame)`) works to make the battles of the beasts possible in the adventure game (the player selects options (`True` and `False`), a battle occurs, then the frames are reset based on the outcome of the battle).

Applying Abstraction - Row 4
The response earned a high score for this row because the selected code segment indicates that an abstraction was developed through the `new_1_button`, `new_2_button`, and `no_button` functions. The first three functions reduce the complexity of the fourth function `def buttons(frame)` because they are called repeatedly and with different parameters. The function `def buttons(frame)` includes `if` statements and the `and` operator.

Sample Response B

Rubric Row	Content Area	Score
1	Developing a Program with a Purpose	High
2	Developing a Program with a Purpose	High
3	Applying Algorithms	Low
4	Applying Abstraction	No score

Developing a Program with a Purpose - Row 1

The response earned a high score because the video shows the program running and the written response summarizes the purpose of the program; a tank game which provides entertainment to the user. The tank is shown moving and shooting other tanks.

Developing a Program with a Purpose - Row 2

The response earned a high score because the response includes two points of difficulty in the development process - adding and removing object associated with the game, and the inclusion of artificial intelligence in the game. The difficulty of adding and removing objects was addressed through the use of one projectile that was set to invisible and relocated at its initial location. The desire for artificial intelligence was replaced with predetermined locations for targets.

Applying Algorithms - Row 3

The response earned a low score because there is only one algorithm identified (calling `TurretHit` method). The description of the algorithm describes its function which is to create fire animation when the projectile is within five meters of the tank. It only includes statements that place the fire image on the tank associated with a projectile that is near that tank. The code segments provided do not include the integration of two or more algorithms.

Applying Abstraction - Row 4

The response did not receive a score because the response does not identify an abstraction that includes mathematical or logical concepts and the abstraction is not identified as managing the complexity of the program.

Sample Response C

Rubric Row	Content Area	Score
1	Developing a Program with a Purpose	High
2	Developing a Program with a Purpose	Low
3	Applying Algorithms	Low
4	Applying Abstraction	No score

Developing a Program with a Purpose - Row 1
The response earned a high score for this row because the video shows the program running and the written response summarizes the purpose of the program; a guessing game that provides hints for particular responses for "larger than" or "smaller than" the guessed number. Finding the random number is also illustrated in the video and summarized in the written response.

Developing a Program with a Purpose - Row 2
The response earned a low score for this row because the response includes only one point in the development process - the generation of a random number to be guessed. This process was completed independently.

Applying Algorithms - Row 3
The response earned a low score for this row because the response did summarize the selected algorithm that included logic in the form of a Boolean expression used in an `if` statement. The written response for the algorithm does not include the integration of two algorithms. Rather than stating a purpose for the algorithm, the response simply provides a line-by-line summary of the algorithm.

Applying Abstraction - Row 4
The response did not receive a score for this row because the response does not include a statement of how the abstraction serves to manage complexity of the program. Instead, the written response included a line by line summary of the abstraction.