Deserted Mall (solution)
by Ong Kah Kien

The initial flavortext mentions a "game" store and "Zombies, Run!". This references the [Zombies, Run! Board Game](), with the given Zombie and Opportunity cards (stylized to just show the colors on both ends and a letter) depicting a game-state that must be solved. The rules for the game can be found on the website, and the key ones are summarized below:
- The 5 chasing Zombies can be evaded by building a "plan" using the colored Opportunity cards.
- A plan comprises a chain of connected Opportunity cards, with each successive card matching its LHS color to the RHS color of the preceding card. The first card in the plan has no color restrictions (in the actual game, it connects to a placeholder plan card which has the wild purple as its RHS color). Once a card is built upon a plan, it cannot be subsequently removed.
- Cards are arranged in 5 vertical Opportunity Stacks (with the topmost card shown lowest) and a horizontal Leader's Hand (below the word "Leader"). Active cards that can only built upon a plan are the topmost cards in each stack, as well as any of the cards in the hand. There is no further replenishment of used cards in this puzzle since the Leader's Deck is not shown.
- Once a plan matches at least the number on the top right of a Zombie's card <u>and</u> the RHS color of its last card matches the LHS color of the zombie's card, it is complete and that zombie is successfully evaded.

Unlike the game, the additional instruction in this puzzle specifies that plans should be:
a) Built one at a time — so a plan must be completed and used before another can be started.
b) Used to escape the zombies in order of proximity — so the first plan should be used to evade the closest Zombie E, and so on until Zombie A.
c) The most efficient ones — so each plan in the solution matches exactly the number on the top right of a Zombie's card. Hence the end result would be 5 chains of (lengths 3,5,2,8,3) Opportunity cards, with 9 leftover unused cards.

The following is the logic flow to build the 5 plans/chains:
1) Zombie E requires a plan of length 3 that ends in blue, so the potential ending card could be the a blue-blue in stack 4, a red-blue in stack 3, or the green-blue in hand. The first two are buried under cards which do not allow for a continuation of the plan if used, hence the ending card must be the green-P-blue in hand. And its preceding card must be the red-V-green from stack 2, as the blue-greens would not have any valid preceding cards. Therefore, the first card must be the blue-B-red from stack 4.
2) Zombie D requires a plan of length 8 that ends in red. To build such a long chain, the cards with yellow are not useful here, since no other cards can join to them. Hence stack 5 is blocked, as are stacks 2 and 4 when they reach those cards with yellow. That leaves 3 possible partial chains: blue-M-blue-Z-blue, green-V-green-E-green, and red-I-red-V-red. The blue-X-green in stack 1 can be used to both free up the second chain and connect it with the first one, so that should be the card used here, rather than the blue-R-green in stack 3 (which would only open up red-blues that are not useful now).

> And the green-V-red in stack 4 (opened up after the blue-blues are used) can be used to connect the second and third partial chains to get the required length of 8.

3) Zombie C requires a plan of length 2 that ends in yellow. The only card that match yellow on the LHS is the yellow-I-yellow, which is buried under two cards with RHS yellow, so it cannot be used. Therefore, only 1 of the cards with RHS yellow will be used in the solution as the ending/second card in the Zombie C plan. And this has to be green-J-yellow at the top of stack 5, so as to free up the two green-red cards for use. Because the other 8 with yellow color and the green-S-blue buried at the bottom of stack 2 would make up exactly the 9 unused cards, meaning all the other 21 cards have to be used. Therefore, the first card in the plan is the blue-R-green from stack 3.

4) Zombie B requires a plan of length 5 that ends in green, so either of the red-J-green must be the ending card. The potential plans are red-green-red-blue-red-blue-green, red-blue-red-green-red-green, and red-blue-red-blue-red-green. Since the two red-greens are both buried under other cards, only the last of these potential plans can be built. So the plan has to be red-Q-blue-R-red-I-blue-F-red-J-green.

5) Zombie A requires a plan of length 3 that ends in red. So the plan comprises the remaining 3 usable cards green-L-red-J-green-V-red.

The 5 unused leftover cards in the stacks spell SHIFT in the visual order. The 4 unused leftover cards in the hand spell NINE. Apply a Caesar Shift of 9 to the letters on the 5 chains (A-E) of Opportunity cards now gives a clue phrase **USE ZAROS AS VIGENERE KEY** for the second part of this puzzle.

The following table summarizes the plans for each Zombie and the extracted letters:

Zombie	Plan (chain of colors)	Letters	After Shift
A	Green-Red-Green-Red	LJV	USE
B	Red-Blue-Red-Blue-Red-Green	QRIFJ	ZAROS
C	Blue-Green-Yellow	RJ	AS
D	Blue-Blue-Blue-Green-Green-Green-Red-Red-Red	MZXVEVIV	VIGENERE
E	Blue-Red-Green-Blue	BVP	KEY

The second part of the puzzle is a reference to the Zombies, Run! Virtual Races, which are regular events organized as part of the Zombies, Run! virtual running phone app (being the original concept behind the board game). This is hinted by the flavortext mentioning "virtually", "5k", "10k" and "outrun", and the image is also part of the Zombies, Run! mobile app official logo. Each of the answers to the text clues references the names of one of the Virtual Races (given by alphabetical order), and a letter could be extracted from these names using the given indices. The Virtual Races referenced are the first 11 organized, and most of the text clues include a year, which also hints that the races and the extracted letters should be reordered in chronological order.

Decrypting the string of extracted letters (in chronological order) using the Vigenere key "ZAROS", the answer for this puzzle **SCOOTER RACE** can be obtained.

The list of clues and answers, in order of the virtual races, and extracted and decrypted letters are summarized in the following table:

Text clue and given index	Answer	Virtual Race reference	Extracted Letter	Decrypted Letter
2014 television drama film by Michael Scott (1)	Run for Your Life	Run for Abel	R	S
2019 action film by Jesse V. Johnson (3)	Triple Threat	Nuclear Threat	C	C
2011 comedy film by Brett Ratner (9)	Tower Heist	The Xia-Hifa Heist	F	O
2008 Japanese television series based on a toy car line (12)	Tomica Hero: Rescue Force	European Rescue Force	C	O
An all-seeing skull by Adafruit Learning Systems (3)	HalloWing	Halloween!	L	T
Book series by Sandra Marton (15)	Special Tactical Units Division	Tactical Zombie Division	D	E
2005 thriller film by Michael Bay (5)	The Island	Tomorrow Island	R	R
2016 horror film by Yeon Sang-ho (4)	Train to Busan	Train to Oban	I	R
1997 book by Michael Harris (9)	Escape from Runway Two Six	Escape from Runaway Fairground	O	A
Namesake incident of a 2016 book by Amy Petulla (14)	Corpsewood Manor Murders	The Abel Manor Murders	U	C
2015 dystopian film by Ben Wheatley (1)	High-Rise	Die Rise	D	E

Constructor's notes:

The answer for this puzzle is another which seems harder to come up with a fitting theme to match to the dystopian or apocalyptic theme of Inside Out, hence it was one of the first I took up to write. The race part was a little broader to find potential puzzle content for, and the popular Zombies, Run! mobile app was an interesting link for an undead theme. The inclusion of the board game provided a logic puzzle element, to contrast against the wordplay element of the Virtual Race names. The use of the Caesar shift and Vigenere cipher were to allow solvers to complete both parts without being spoiled on the steps due to the words/phrase.