There are 5 friends picking 6 hats consisting of 3 white and 3 black hats. This would mean the 3 of the friends must pick one colour and 2 of the friends must pick the other colour. Either colour configuration (3 black and 2 white or 2 black 3 white) does not matter as they are can just be considered flipped versions of each other and therefore for simplicity I will only be considering the condition where there are 3 white hats, 2 black hats and the colour of the hat left in the bag is black.

Initially the only way to know for certain the colour of your own hat would be to see 3 of the other colours. Then you would know for certain that you are wearing the other colour hat. However, there is a long pause, therefore this is not the case. As the back most friend can see 4 of his friends this means that the only way that the friend sitting in the back most chair can not see 3 hats of one colour is if he sees 2 black and 2 white hats.

This long pause can also give the friends sitting in front the information that there must be 2 black and 2 white hats amongst the front 4 friends. Using this info these friends can know their own colour of hat if they see 2 hats of the same colour. It would be impossible for the front 2 friends to see 2 hats so it must be C and D in the 3rd and 4th position seeing the front 2 hats as the same colour in order for them to simultaneously realize what colour their own hat is.

Hearing this, the friends can realize that C and D in the 3rd and 4th position were the same colour. This is not new information to the friend at the very back. However, this information combined with the previous knowledge that there must be 2 black and 2 white hats amongst the front 4 friends allows the left over front 2 friends to be able know what colour they would be if they can see the others hat colour as its colour must be the same. The front most friend can not see the others colour however the friend in the 2nd position can see the front most friends hat colour and realize that its own hat colour is the same. Therefore, B realizing its colour means it must be in the 2nd position.

Both E and A never know their own colour. We do know that E and A must be in either in the 1st position or the 5th position. However, we do know that A's hat was the same colour as the one left in the bag or , in other words, A's hat was the minority colour. This means A cannot be in the 5th position as we know the first 4 positions contain 2 black and 2 white hats; therefore, whatever colour has the friend in the 5th position is wearing is the majority colour. Therefore, E must be in the 5th position and A is in the 1st position.

With this we know the order of the friend starting from front is A, B, (C or D), (C or D), E. However, we also know that the five chairs are labelled A to E from front to back and not all the chair labels matched the names of the persons sitting in them. Therefore, C cannot be in the 3rd position as D would be in the 4th position and all the chair labels would match the names of the persons sitting in them. Therefore, C must be in the 4th position and D in the 3rd position.

With this we know the order of the friend starting from front is A, B, D, C, E.