Combine the flour and pepper on a large plate. Pat the fish fillets dry with paper towels. One fillet at a time, coat each thoroughly with the flour mixture. Heat the oil in a large skillet over medium-high heat. Cook the fillets for 2 minutes per side, flipping only once.

Melt the butter in another large skillet over medium heat. Add the mushrooms, scallions, and garlic. Turn the heat to medium-high after 2 minutes and sauté, stirring often for 7 to 8 minutes. Add the juice of 1 lemon half to the pan and remove from heat. Pour the vegetable mixture evenly over the fillets. Slice the remaining lemon half into 4 wedges and serve with the fish.