

Question 4

a.

```
one_line <- function(stops) {  
  total_time <- 0  
  for (index in seq(1, stops, by = 1)) {  
    stoppage_time = 2  
    delay <- rbernoulli(1, 0.2)  
    if (delay == 1) {  
      delay_time = rgamma(1, shape = 5, scale = 0.5)  
      stoppage_time = 2 + delay_time  
    }  
    total_time = total_time + stoppage_time  
  }  
  return(total_time)  
}
```

```
one_line <- function(stops) {  
  
  total_time <- 0  
  
  for (index in seq(1, stops, by = 1)) {  
  
    stoppage_time = 2  
  
    delay <- rbernoulli(1, 0.2)  
  
    if (delay == 1) {  
  
      delay_time = rgamma(1, shape = 5, scale = 0.5)  
      stoppage_time = 2 + delay_time  
    }  
  
    total_time = total_time + stoppage_time  
  
  }  
  
  return(total_time)  
}
```

b.

```
one_trip <- function(vec) {  
  vec <- as.list(vec)  
  final_time = 0  
  for(v in vec) {  
    for(e in v) {  
      final_time = final_time + one_line(e)  
    }  
  }  
  return(final_time)  
}
```

```
one_trip <- function(vec) {  
  
  vec <- as.list(vec)  
  
  final_time = 0  
  
  for(v in vec) {  
  
    for(e in v) {  
  
      final_time = final_time + one_line(e)  
    }  
  }  
  
  return(final_time)  
}
```

c.

```
lower_and_upper <- function(seed, vecto, trips) {  
  set.seed(seed)  
  samples <- vector()  
  
  for (i in rep(1:trips)) {  
    single = one_trip(vecto)  
    samples = append(samples, single)  
  }  
  
  return(quantile(samples, c(.10, .90)))  
}
```

```
lower_and_upper <- function(seed, vecto, trips) {  
  set.seed(seed)  
  samples <- vector()  
  
  for (i in rep(1:trips)) {  
    single = one_trip(vecto)  
    samples = append(samples, single)  
  }  
  
  return(quantile(samples, c(.10, .90)))  
}
```