During the dinner hour, the distribution of the inter-arrival time of customers at a restaurant is estimated to be as shown below. The mode of payment and the service times of the cash and credit card customers are shown in the following tables. Complete the tables and simulate the system for 20 customer arrivals and determine the average time a cash and credit card customer must wait in line before paying the cashier.

Use Column A of the given random number table to determine the customer inter-arrival time. For the arrival time, please start at 0 seconds, and increments in seconds from the results you get from decoding of the random numbers. As an example, the first random number is 6320, which equates to 60 seconds of inter-arrival time. So, your first customer arrival time is 60 seconds. For your second customer, the random number is 4630, which also equates to 60 seconds of inter-arrival time. As a result, your second customer arrival time will be 120 seconds, and so on. Please keep your results in seconds for all customers.

Use Column B to determine whether the customer pays with cash or credit, and Column C to determine the service time.

Inter-arrival time

|  |  |  |  |
| --- | --- | --- | --- |
| Inter-arrival Time | Probability | Cumulative Probability | Random Number Interval |
| 30 seconds | 0.45 |  |  |
| 60 seconds | 0.25 |  |  |
| 90 seconds | 0.15 |  |  |
| 120 seconds | 0.10 |  |  |
| 150 seconds | 0.05 |  |  |

Mode of Payment

|  |  |  |  |
| --- | --- | --- | --- |
| Payment Mode | Probability | Cumulative Probability | Random Number Interval |
| Cash | 0.6 |  |  |
| Credit Card | 0.4 |  |  |

Cash Service Time

|  |  |  |  |
| --- | --- | --- | --- |
| Service Time | Probability | Cumulative Probability | Random Number Interval |
| 20 seconds | 0.35 |  |  |
| 40 seconds | 0.30 |  |  |
| 60 seconds | 0.25 |  |  |
| 80 seconds | 0.10 |  |  |

Credit Card Service Time

|  |  |  |  |
| --- | --- | --- | --- |
| Service Time | Probability | Cumulative Probability | Random Number Interval |
| 30 seconds | 0.20 |  |  |
| 60 seconds | 0.45 |  |  |
| 90 seconds | 0.25 |  |  |
| 120 seconds | 0.10 |  |  |

|  |  |  |
| --- | --- | --- |
| Random Numbers | | |
| (A) | (B) | (C) |
| 6320 | 1094 | 1995 |
| 4630 | 7371 | 7971 |
| 8657 | 2809 | 3554 |
| 0030 | 5148 | 6300 |
| 5624 | 9115 | 5495 |
| 6728 | 1469 | 5165 |
| 5925 | 6480 | 9339 |
| 2829 | 2447 | 6997 |
| 7939 | 7031 | 1443 |
| 6476 | 8442 | 3574 |
| 3319 | 7387 | 0150 |
| 8134 | 1788 | 0933 |
| 1712 | 4891 | 7082 |
| 6317 | 1149 | 5025 |
| 6605 | 8822 | 4081 |
| 2734 | 9451 | 4100 |
| 0432 | 2990 | 7190 |
| 3441 | 8314 | 6822 |
| 0726 | 7176 | 5053 |
| 6969 | 2766 | 8284 |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Customer** | **Random Number** | **Arrival Time** | **Random Number** | | **Mode of Payment** | **Random Number** | **Service Time** | **Service Time** | | **Waiting Time** | |
|  |  |  |  | |  |  |  | **Begins** | **Ends** | **Cash** | **Credit** |
| 1 |  |  |  | |  |  |  |  |  |  |  |
| 2 |  |  |  | |  |  |  |  |  |  |  |
| 3 |  |  |  | |  |  |  |  |  |  |  |
| 4 |  |  |  | |  |  |  |  |  |  |  |
| 5 |  |  |  | |  |  |  |  |  |  |  |
| 6 |  |  |  | |  |  |  |  |  |  |  |
| 7 |  |  |  | |  |  |  |  |  |  |  |
| 8 |  |  |  | |  |  |  |  |  |  |  |
| 9 |  |  |  | |  |  |  |  |  |  |  |
| 10 |  |  |  | |  |  |  |  |  |  |  |
| 11 |  |  |  | |  |  |  |  |  |  |  |
| 12 |  |  |  | |  |  |  |  |  |  |  |
| 13 |  |  |  | |  |  |  |  |  |  |  |
| 14 |  |  |  | |  |  |  |  |  |  |  |
| 15 |  |  |  | |  |  |  |  |  |  |  |
| 16 |  |  |  | |  |  |  |  |  |  |  |
| 17 |  |  |  | |  |  |  |  |  |  |  |
| 18 |  |  |  | |  |  |  |  |  |  |  |
| 19 |  |  |  | |  |  |  |  |  |  |  |
| 20 |  |  |  | |  |  |  |  |  |  |  |
|  |  |  |  | |  |  |  |  |  |  |  |
| Average Waiting Time (Cash)= | | | |
| Average Waiting Time (Credit)= | | | |