CMPSC 360 Lab Report for Random Variables

Code

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// Section: 2

// Lab: Random variables

// Date: Apr 30, 2014

// Description: Implementation of a PDF from the example in class for the number of inhabitants

// in a household

#include <iostream>

using namespace std;

double PDF()

//POST: The probability of PDF == 1 is 25%

// The probability of PDF == 2 is 32%

// The probability of PDF == 3 is 17%

// The probability of PDF == 4 is 15%

// The probability of PDF == 5 is 7%

// The probability of PDF == 6 is 3%

// The probability of PDF == 7 is 1%

{

//DATA DICTIONARY

int random; //a random integer

int people; //number of inhabitants in a household

people = 7;

random = rand()%100+1;

if (random <= 99) //if [random] falls into the CDF of [people] <= 6

{

people--;

}

if (random <= 96) //if [random] falls into the CDF of [people] <= 5

{

people--;

}

if (random <= 89) //if [random] falls into the CDF of [people] <= 4

{

people--;

}

if (random <= 74) //if [random] falls into the CDF of [people] <= 3

{

people--;

}

if (random <= 57) //if [random] falls into the CDF of [people] <= 2

{

people--;

}

if (random <= 25) //if [random] falls into the CDF of [people] == 1

{

people--;

}

return people;

}

int main()

{

//DATA DICTIONARY

int ctr\_1;

int ctr\_2;

int ctr\_3;

int ctr\_4;

int ctr\_5;

int ctr\_6;

int ctr\_7;

int probability;

ctr\_1 = 0;

ctr\_2 = 0;

ctr\_3 = 0;

ctr\_4 = 0;

ctr\_5 = 0;

ctr\_6 = 0;

ctr\_7 = 0;

for (int i=0; i<= 100; i++)

{

probability = PDF();

cout << probability << " ";

if (probability == 1)

{

ctr\_1++;

}

if (probability == 2)

{

ctr\_2++;

}

if (probability == 3)

{

ctr\_3++;

}

if (probability == 4)

{

ctr\_4++;

}

if (probability == 5)

{

ctr\_5++;

}

if (probability == 6)

{

ctr\_6++;

}

if (probability == 7)

{

ctr\_7++;

}

}

cout << endl;

cout << "There are " << ctr\_1 << " 1(s) in 100 excutions of PDF " << endl;

cout << "There are " << ctr\_2 << " 2(s) in 100 excutions of PDF " << endl;

cout << "There are " << ctr\_3 << " 3(s) in 100 excutions of PDF " << endl;

cout << "There are " << ctr\_4 << " 4(s) in 100 excutions of PDF " << endl;

cout << "There are " << ctr\_5 << " 5(s) in 100 excutions of PDF " << endl;

cout << "There are " << ctr\_6 << " 6(s) in 100 excutions of PDF " << endl;

cout << "There are " << ctr\_7 << " 7(s) in 100 excutions of PDF " << endl;

return 0;

}

Sample Runs

1 2 3 3 2 3 2 4 1 1 2 3 5 2 4 1 2 2 2 1 1 3 1 3 3 2 7 4 1 2 6 2 1 3 1 2 4 2 4 1 3 3 5 2 4 2 2 5 5 3 1 2 1 2 3 5 1 6 2 1 1 3 2 1 1 2 4 1 2 2 6 4 2 1 3 1 3 2 2 3 1 5 2 1 1 5 1 1 2 6 4 1 1 4 2 3 1 2 2 2 1

There are 30 1(s) in 100 executions of PDF

There are 32 2(s) in 100 executions of PDF

There are 17 3(s) in 100 executions of PDF

There are 10 4(s) in 100 executions of PDF

There are 7 5(s) in 100 executions of PDF

There are 4 6(s) in 100 executions of PDF

There are 1 7(s) in 100 executions of PDF