Assignment 2

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Download all python codes from

https://github.com/rubeenaafreen20/EE5600AI−ML/tree/master/Assignment2/Code

and latex codes from

https://github.com/rubeenaafreen20/EE5600AI−ML/tree/master/Assignment2

1 Problem

On one page of a telephone directory, there were 200 telephone numbers. The frequency distribution of their unit place digit (for example, in the number 25828573, the unit place digit is 3) is given in Table below

Digit	0	1	2	3	4	5	6	7	8	9
Frequency	22	26	22	22	20	10	14	28	16	20

TABLE 0: Frequency Distribution

Without looking at the page, the pencil is placed on one of these numbers, i.e., the number is chosen at random. What is the probability that the digit in its unit place is 6?

2 Explanation

probability is defined as

$$P = \frac{\text{number of outcomes}}{\text{Sample space}} \tag{2.0.1}$$

3 Solution

Let $X \in \{i\}_{i=1}^{i=6}$ and f_i be the corresponding frequency. Then,

$$P_r(X = i) = \frac{f_i}{200} \tag{3.0.1}$$

From table 0,

$$P_r(X = 6) = \frac{14}{200} \tag{3.0.2}$$

$$= 0.07 \tag{3.0.3}$$

4 Output

The output of Python program is attached below

```
Last digits of each of these numbers generated are:
 [1, 4, 6, 0, 4, 5, 4, 2, 1, 3, 9, 0, 3, 2, 7, 1, 8, 1, 5, 5, 9, 1, 1, 7, 1, 2, 6, 1, 9, 9, 5, 8, 0, 0, 0, 6, 9,
5, 2, 0, 0, 1, 9, 5, 1, 5, 7, 3, 8, 9, 4, 4, 4, 7, 1, 4, 6, 6, 3, 0, 0, 8, 3, 0, 9, 3, 9, 6, 9, 4, 7, 4, 8, 2, 9,
4, 8, 7, 0, 6, 7, 4, 8, 3, 2, 9, 6, 9, 0, 5, 9, 4, 6, 2, 7, 4, 7, 4, 1, 6, 7, 0, 5, 0, 6, 0, 5, 6, 7, 7, 7, 1, 8,
8, 3, 9, 0, 8, 6, 3, 4, 4, 3, 0, 7, 6, 7, 8, 2, 8, 4, 5, 0, 9, 9, 7, 6, 2, 2, 8, 0, 0, 3, 7, 9, 2, 0, 7, 2, 1, 1,
7, 9, 0, 2, 5, 1, 4, 6, 8, 7, 8, 2, 2, 5, 1, 3, 4, 8, 9, 5, 1, 8, 2, 8, 9, 1, 1, 3, 4, 1, 6, 9, 4, 6, 4, 5, 3, 4,
9, 5, 1, 1, 6, 3, 8, 8, 2, 6, 7]
freq of digits of random num generated is
 0    23
1    23
2    17
3    15
4    23
5    16
6    20
7    21
8    20
9    22
dtype: int32

 A random last digit chosen:  3
Probability of randomly chosen digit 3 as unit digit is:  0.015
```

Fig. 0: Output