

파이썬프로그래밍및실습

Infectious Disease

Infection

Probability

Notification

Program

Progress Report : 1

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Name : Joosungmin

ID : 233897

1. Introduction

1) Background

As the COVID pandemic breaks out, people's worries about the epidemic grow. It is necessary to provide information on various infectious diseases. In order to solve this problem, a program is needed to calculate the probability of infection for various infectious diseases and let users know if there is an overlapping movement with the infected person by receiving activity records.

2) Project goal

It aims to compare the input user's activity records with the activity records of infected people of various infectious diseases to find the probability of infection according to the contact time if there is an overlapping movement, and if the probability is high, it is judged as a preliminary infected person and to create a program to warn other users who have come into contact with preliminary infected people other than the infected person.

3) Differences from existing programs

In the case of existing COVID-19 emergency disaster texts, people are simply informed of the time when the confirmed person overlaps with the route, so the judgment on the COVID-19 test is determined according to their condition, and if it is an incubation period, it may not be tested, which may cause the spread to

repeat again. We are different from existing programs in that we find the probability of infection by considering the contact time of each disease, and we repeat the process of dividing users with high probability into preliminary infections and comparing them with other users to prevent resurgence.

2. Functional Requirement

1) Function 1 Register travel routes

- The ability to receive and store the user's travel path by the hour

(1) Detailed function 1 Enter the name of the place that was in hourly increments

- Enter the place where you moved from 8 a.m. to 10 p.m. and the time you stayed.

2) Function 2 Check for infectious diseases

- The ability to ask for the presence or absence of three infectious diseases (flu, corona, and tuberculosis) and receive input as o,x

3) Function 3 Notify others

- The function of calculating the probability of transmission according to the overlapping time by comparing the travel route of a user infected with an infectious disease one day before with other users and informing users

(1) Detailed function 1 The time overlapping with the travel route of a user infected with an infectious disease one day ago is calculated, and the probability of infection is set as 30% for 1 hour, 60% for 2 hours, and 90% for 3 hours, respectively. (There is no accurate information on the correlation between contact time and infection probability, so the probability is arbitrarily set) Notify other users. Users who overlap for more than 3 hours are designated as preliminary infections and repeat the above function once more. At this time, the probability of secondary

user infection is $(90\% \times \text{probability for contact time})$.

3. Progress

1) Functional implementation

(1) Register travel routes

- input: route, hour / output: infection
- The place and time stayed by the user are inputted as 'input' and stored in the travel path list.
- class, list, condition, loop
- code screen shot

```
print("지금부터 전염병(독감, 코로나, 결핵)의 감염 확률을 계산하기 위한 프로그램을 실행합니다.")
print("장소와 시간순으로 입력하며 시간은 한시간 단위로 입력해 주세요.")
print("입력은 오전 8시부터 시작하여 오후 10시까지 가능합니다.")

# Function 1
infection = [] # 이동경로를 저장하기 위한 빈 리스트 생성
i = 0
while i < 14:
    route = str(input("본인이 있었던 장소를 입력하세요: "))
    hour = int(input("머무른 시간을 입력하세요: "))
    # 한번에 입력 가능한 시간을 초과 시
    if hour > 14:
        print("입력 가능한 시간을 넘었습니다. 다시 입력해 주세요.")
        continue
    for j in range(hour):
        infection.append(route) # 리스트에 머무른 시간 수의 이동경로 추가
    i += hour # 머무른 시간만큼 i를 증가시킨다.
# 리스트에 오후 10시 이후의 장소까지 저장되었을 경우
if len(infection) > 14:
    print("오후 10시 이후의 장소와 시간은 삭제합니다.")
print(i)
print(infection) # 오후 10시 이후 삭제전 리스트
del infection[14:]
print(infection) # 오후 10시 이후 삭제후 리스트
```

(2) Check for infectious diseases

- input: str(input) / output: flu_answer, corona_answer, tuber_answer
- Ask for the presence or absence of three infectious diseases (flu, corona, and tuberculosis)

and receive input as o,x

- class

- code screen shot

```
# Function 2
print("다음 질문에 o,x로 대답해 주세요.")
flu_answer = str(input("독감에 걸린 상태입니까?: "))
corona_answer = str(input("코로나에 걸린 상태입니까?: "))
tuber_answer = str(input("결핵에 걸린 상태입니까?: "))
print(flu_answer, corona_answer, tuber_answer)
```

2) Test Results

(1) Register travel routes

- After receiving the input from the user, the total input time is output, the list is output, and the information after 10 p.m. is deleted, and a final list to be used for a subsequent function is output.

- test result screen shot

```
지금부터 전염병(독감, 코로나, 결핵)의 감염 확률을 계산하기 위한 프로그램을 실행합니다.
장소와 시간순으로 입력하며 시간은 한시간 단위로 입력해 주세요.
입력은 오전 8시부터 시작하여 오후 10시까지 가능합니다.
본인이 있었던 장소를 입력하세요: 자3
머무른 시간을 입력하세요: 2
본인이 있었던 장소를 입력하세요: 공6
머무른 시간을 입력하세요: 6
본인이 있었던 장소를 입력하세요: 경1
머무른 시간을 입력하세요: 4
본인이 있었던 장소를 입력하세요: 2생
머무른 시간을 입력하세요: 3
오후 10시 이후의 장소와 시간은 삭제합니다.
15
['자3', '자3', '공6', '공6', '공6', '공6', '공6', '공6', '공6', '경1', '경1', '경1', '경1', '2생', '2생', '2생']
['자3', '자3', '공6', '공6', '공6', '공6', '공6', '공6', '경1', '경1', '경1', '경1', '2생', '2생']
```

(2) Check for infectious diseases

- Through 'input', the infection of flu, corona, and tuberculosis is inputted as o,x and then outputted.

- test result screen shot

다음 질문에 o, x로 답해 주세요.
 독감에 걸린 상태입니까?: o
 코로나에 걸린 상태입니까?: x
 결핵에 걸린 상태입니까?: x
 o x x

4. Changes in Comparison to the Plan

None

5. Schedule

Work		11/3	11/19	11/26	12/17	12/22
proposal		complete				
Function1	Detailed function1		complete			
Function2	Detailed function1			complete		
Function3	Detailed function1				----->	
Final source files and Rinal report						----->