Name:

IIT Kanpur
ESC101 Fundam. of Comp.
Minor Quiz 6B
Date: March 13, 2018

Roll No:
e.g. 170001

Dept.:
e.g. CHE

Sect.:
e.g. A4

Instructions:

Total: **10 marks**

1. Write your name, roll number, department, section on **every side of every sheet** of this quiz paper
2. Write final answers **neatly with a pen** in the given box.
3. Do not give derivations/elaborate steps unless the question specifically asks you to provide these.

Problem 1 (**How to Handle Multiple Email IDs?**: 2+2+2+2+2=10 marks). I have following 6 email IDs:

1. anujnag@iitk.ac.in (My IITK Email ID)

2. anujnag@cse.iitk.ac.in (My CSE Email ID)

3. anujnag@hotmail.com (My Hotmail Email ID)

4. anujnagpal96@gmail.com (My Primary Gmail ID)

5. mailanjgr8@gmail.com (My Embarrassing Gmail ID I created when I was a kid)

6. Anuj.Nagpal@ny.email.gs.com (My Work Email ID)

I am facing a lot of trouble in handling all these email IDs. So I devised certain rules to make my life easy:

- Since I can't keep checking mailboxes of so many IDs everyday, I want some of my email IDs to forward all the mails they receive to anujnagpal96@gmail.com. (Email forwarding here refers to re-sending an email message delivered to an email address to anujnagpal96@gmail.com)

- I am not allowed to send any email from my work email ID to any of my other email IDs due to confidentiality reasons. So whenever I accidentally send a mail using Anuj.Nagpal@ny.email.gs.com to any of my other email IDs, I want a warning message to be printed.

- I am unsubscribing mailanjgr8@gmail.com from everywhere and making anujnagpal96@gmail.com as my primary email ID. So whenever someone sends a mail to mailanjgr8@gmail.com, I want a notification reminding me to unsubscribe.

Following these rules, I coded a function recv_mail() which is called whenever someone tries to send a mail to any of my above 6 email IDs. Please go through the code of this function on next page and answer the questions on next to next page.

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```c
#include <stdio.h>
#include <string.h>

//2D array of strings for storing email IDs
char email[6][30] = {"anujnag@iitk.ac.in", "anujnag@cse.iitk.ac.in",
    "anujnag@hotmail.com", "mailanjgr8@gmail.com", "anujnagpal96@gmail
    .com", "Anuj.Nagpal@ny.email.gs.com"};

void recv_email(char sender[], char receiver[]) {
  int i=0,j=0;
  printf("%s -> %s\n", sender, receiver);

  // Choosing certain email IDs to forward mails to
  // anujnagpal96@gmail.com on receiveing a mail
  if(strncmp(receiver, "anujnag", 7)==0 && receiver[7]=='@')
      recv_email(sender, email[4]);

  // Printing a special notification in case if
  // someone sends a mail to mailanjgr8@gmail.com
  while(receiver[j]!='\0')
  {
    if(receiver[j]=='8')
    {
      recv_email(sender, email[4]);
      printf("%s is still subscribed to %s\n", email[3], sender);
    }
    j++;
  }

  // Printing a warning message if sender
  // email ID might be my work email ID
  while(sender[i]!='@')
  {
    if(sender[i]=='.')
    {
      printf("Warning!!\n");
      return;
    }
    i++;
  }
  return;
}

int main () {
  recv_email(email[5], email[0]);
  return 0;
}
```

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1. ***Mention all the email IDs that are forwarding all the emails to anujnagapal96@gmail.com as well***

```
1   anujnag@iitk.ac.in
2   anujnag@cse.iitk.ac.in
3   anujnag@hotmail.com
4   mailanjgr8@gmail.com
```

2. ***What is the need of second && condition on line 13 i.e. receiver[7]=='@'? Explain briefly any possible bugs/errors on removing it***

```
1   Possibility of infinite loop because otherwise anujnagpal96@gmail.com
       will keep forwarding mails to itself.
```

3. ***Will there be any issue or flaw if I change the loop condition on line 30 from sender[i]!='@' to sender[i]!='\0'? Please explain***

```
1   The logic currently is looking for the presence of '.' in the  username
       (Anuj'.'Nagpal) to warn if it the sender can be work email ID. If we
       look for '.' before the end of string instead of '@', the logic will
       start giving warning for every email ID beacuse '.' is present in
       every domain (iitk'.'ac'.'in or cse'.'iitk'.'ac'.'in etc)
```

4. ***Write the output of the above program on execution***

```
1   Anuj.Nagpal@ny.email.gs.com -> anujnag@iitk.ac.in
2   Anuj.Nagpal@ny.email.gs.com -> anujnagpal96@gmail.com
3   Warning!!
4   Warning!!
```

5. ***There is a need of a third && condition on line 13 : strcmp(sender, email[4])!=0 to avoid redundant forwarding. Can you mention one example of recv_mail() function call where this additional condition stops the otherwise redundant forwarding?***

```
1   Multiple answers possible.
2   Try recv_mail(email[4], email[1]). Output will be:
3   anujnagpal96@gmail.com -> anujnag@cse.iitk.ac.in
4   anujnagpal96@gmail.com -> anujnagpal96@gmail.com
5   The second redundant forwarding can be removed by this additional check.
```

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BLANK SPACE: Any answers written here will be left ungraded.
No exceptions.
You may use this space for rough work.

FOR ROUGH WORK ONLY