190905513 **LAB 02** **MOHAMMAD DANISH EQBAL**

BATCH A3 **PRELIMINARY SCANNING APPLICATIONS** **SECTION A**

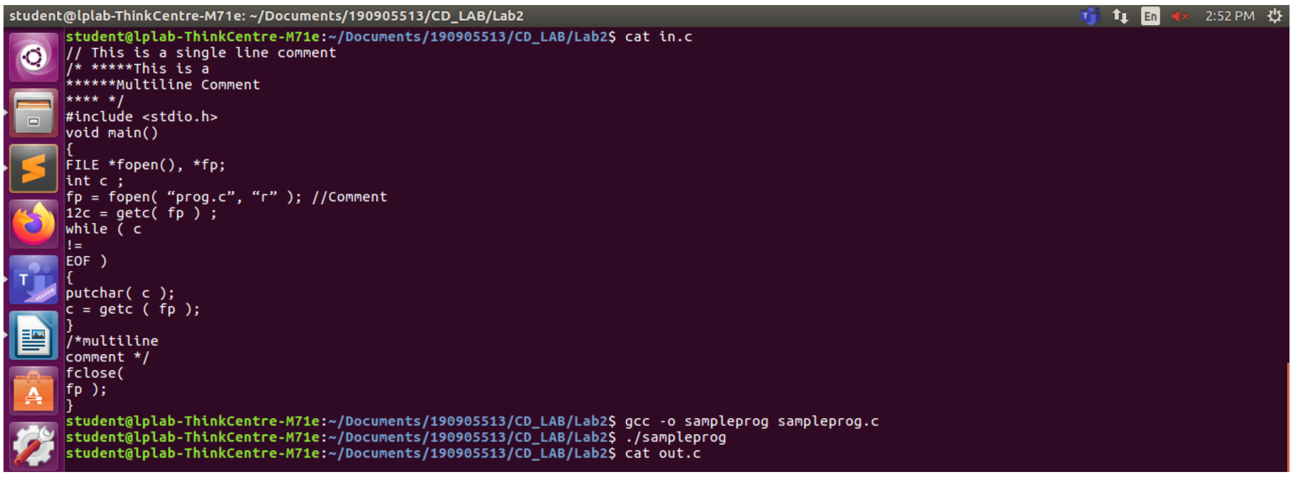
SAMPLE EXERCISE:

Program to remove single and multiline comments from a given ‘C’ file.

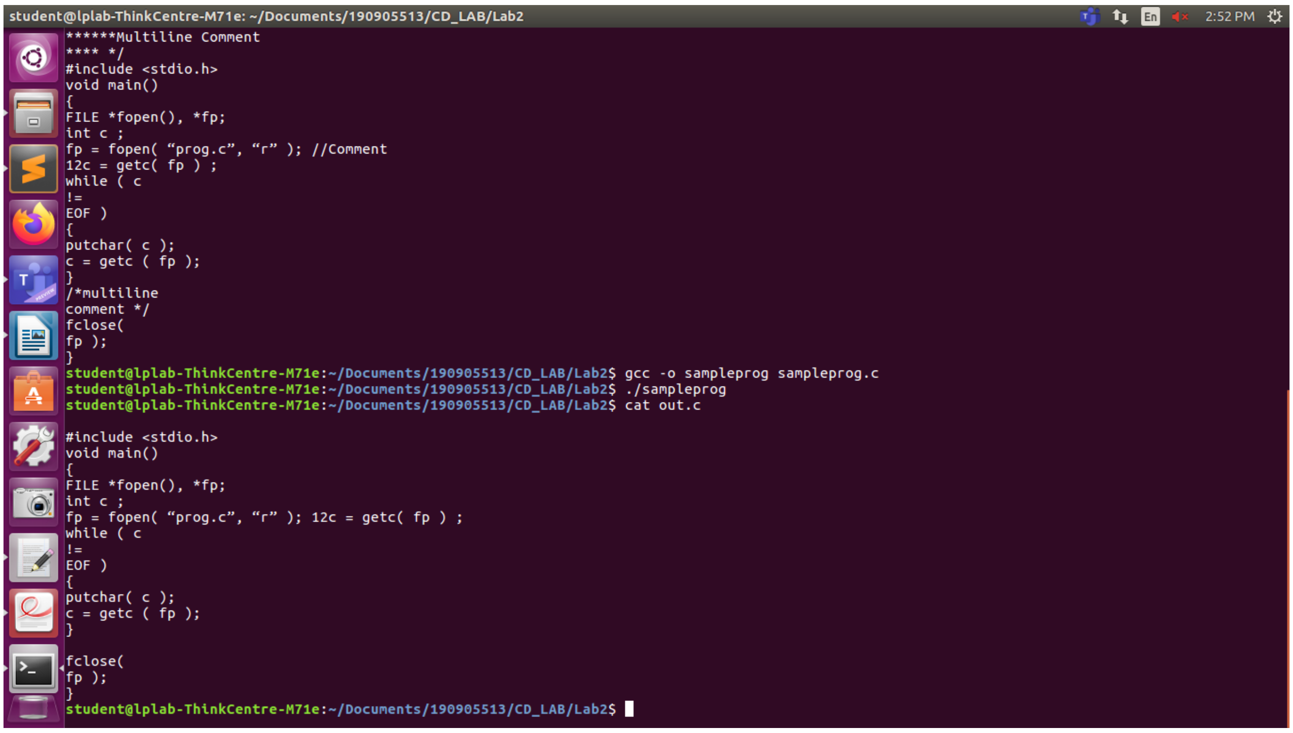
Program:

```
//Program to remove single and multiline comments from a given ‘C’
file.
#include <stdio.h>
#include <stdlib.h>
int main()
{
FILE *fa, *fb;
int ca, cb;
fa = fopen("in.c", "r");
if (fa == NULL){
printf("Cannot open file \n");
exit(0); }
fb = fopen("out.c", "w");
ca = getc(fa);
while (ca != EOF)
{
if(ca==' ')
{
putc(ca,fb);
while(ca==' ')
ca = getc(fa);
}
if (ca=='/')
{
cb = getc(fa);
if (cb == '/')
{
while(ca != '\n')
ca = getc(fa);
}
else if (cb == '*')
{
do
{
while(ca != '*')
ca = getc(fa);
ca = getc(fa);
} while (ca != '/');
}
else
{
putc(ca,fb);
putc(cb,fb);
}
}
else putc(ca,fb);
ca = getc(fa);
}
fclose(fa);
fclose(fb);
return 0;
}
```

Output:


student@lplab-ThinkCentre-M71e: ~/Documents/190905513/CD_LAB/Lab2
En
2:52 PM

```
student@lplab-ThinkCentre-M71e:~/Documents/190905513/CD_LAB/Lab2$ cat in.c
// This is a single line comment
/* *****This is a
******Multiline Comment
**** */
#include <stdio.h>
void main()
{
FILE *fopen(), *fp;
int c ;
fp = fopen( “prog.c”, “r” ); //Comment
12c = getc( fp ) ;
while ( c
!=
EOF )
{
putchar( c );
c = getc ( fp );
}
/*multiline
comment */
fclose(
fp );
}
student@lplab-ThinkCentre-M71e:~/Documents/190905513/CD_LAB/Lab2$ gcc -o sampleprog sampleprog.c
student@lplab-ThinkCentre-M71e:~/Documents/190905513/CD_LAB/Lab2$ ./sampleprog
student@lplab-ThinkCentre-M71e:~/Documents/190905513/CD_LAB/Lab2$ cat out.c
```


student@lplab-ThinkCentre-M71e: ~/Documents/190905513/CD_LAB/Lab2
En
2:52 PM

```
******Multiline Comment
**** */
#include <stdio.h>
void main()
{
FILE *fopen(), *fp;
int c ;
fp = fopen( “prog.c”, “r” ); //Comment
12c = getc( fp ) ;
while ( c
!=
EOF )
{
putchar( c );
c = getc ( fp );
}
/*multiline
comment */
fclose(
fp );
}
student@lplab-ThinkCentre-M71e:~/Documents/190905513/CD_LAB/Lab2$ gcc -o sampleprog sampleprog.c
student@lplab-ThinkCentre-M71e:~/Documents/190905513/CD_LAB/Lab2$ ./sampleprog
student@lplab-ThinkCentre-M71e:~/Documents/190905513/CD_LAB/Lab2$ cat out.c

#include <stdio.h>
void main()
{
FILE *fopen(), *fp;
int c ;
fp = fopen( “prog.c”, “r” ); 12c = getc( fp ) ;
while ( c
!=
EOF )
{
putchar( c );
c = getc ( fp );
}

fclose(
fp );
}
student@lplab-ThinkCentre-M71e:~/Documents/190905513/CD_LAB/Lab2$
```

<u>LAB EXERCISES:</u>

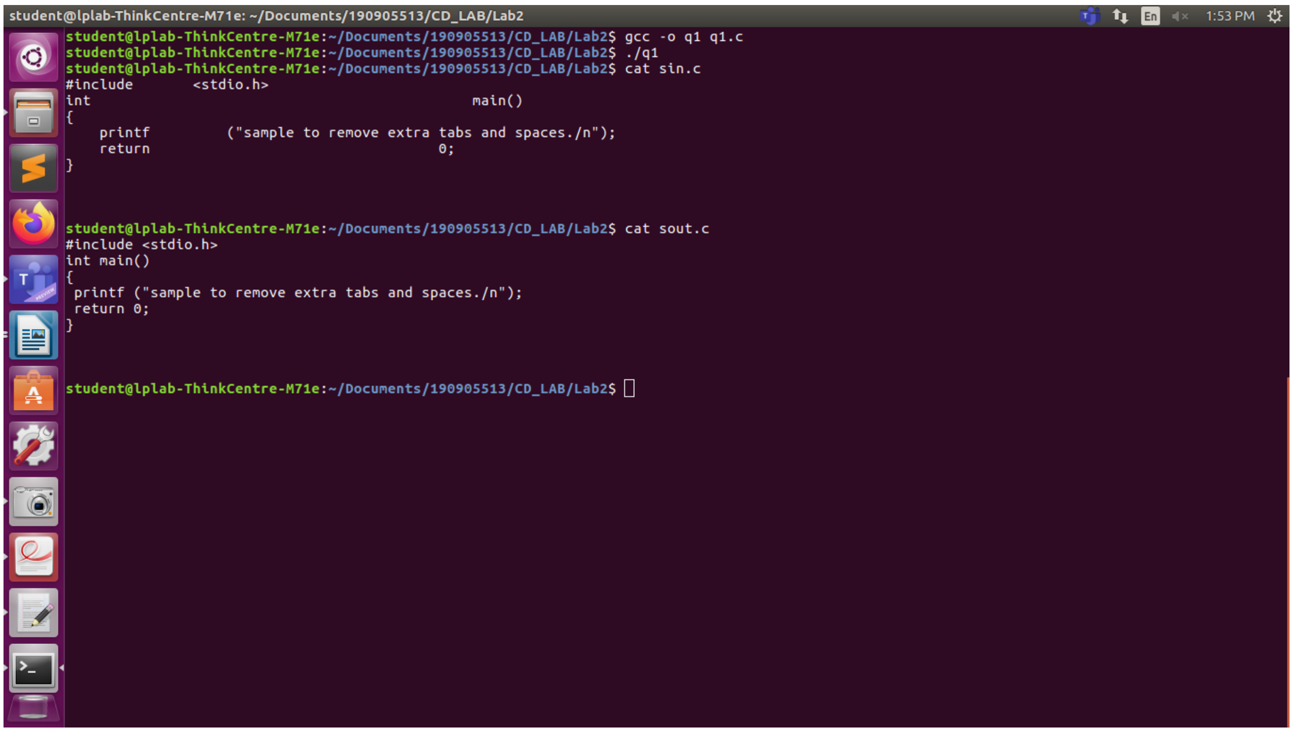
Write a ‘C’ program

1. That takes a file as input and replaces blank spaces and tabs by single space and writes the output to a file.

Program:

```
/*Program that takes a file as input and replaces blank spaces and
tabs by single space and writes the output to a file.*/
#include <stdio.h>
#include <string.h>
#include <unistd.h>
#include <stdlib.h>

int main()
{
    int flag=0;
    char c;
    FILE *f1,*f2;
    f1 = fopen("sin.c", "r");
  f2 = fopen("sout.c", "w");

  if(f1 == NULL || f2 == NULL)
  {
    perror("Files missing..\n");
    return 1;
  }

  while(1)
  {
    c = fgetc(f1);

    if(c==EOF)
    {
      break;
    }

    else if(!flag && (c==' '||c=='\t'))
    {
      fputc(' ', f2);
      flag = 1;
    }

    else if(!(c==' '||c=='\t'))
    {
      flag = 0;
      fputc(c, f2);
    }
  }
  fclose(f1);
  fclose(f2);
}
```

Output:



```
student@lplab-ThinkCentre-M71e: ~/Documents/190905513/CD_LAB/Lab2
student@lplab-ThinkCentre-M71e:~/Documents/190905513/CD_LAB/Lab2$ gcc -o q1 q1.c
student@lplab-ThinkCentre-M71e:~/Documents/190905513/CD_LAB/Lab2$ ./q1
student@lplab-ThinkCentre-M71e:~/Documents/190905513/CD_LAB/Lab2$ cat sin.c
#include       <stdio.h>
int                                             main()
{
    printf         ("sample to remove extra tabs and spaces./n");
    return                                  0;
}


student@lplab-ThinkCentre-M71e:~/Documents/190905513/CD_LAB/Lab2$ cat sout.c
#include <stdio.h>
int main()
{
 printf ("sample to remove extra tabs and spaces./n");
 return 0;
}


student@lplab-ThinkCentre-M71e:~/Documents/190905513/CD_LAB/Lab2$ 
```

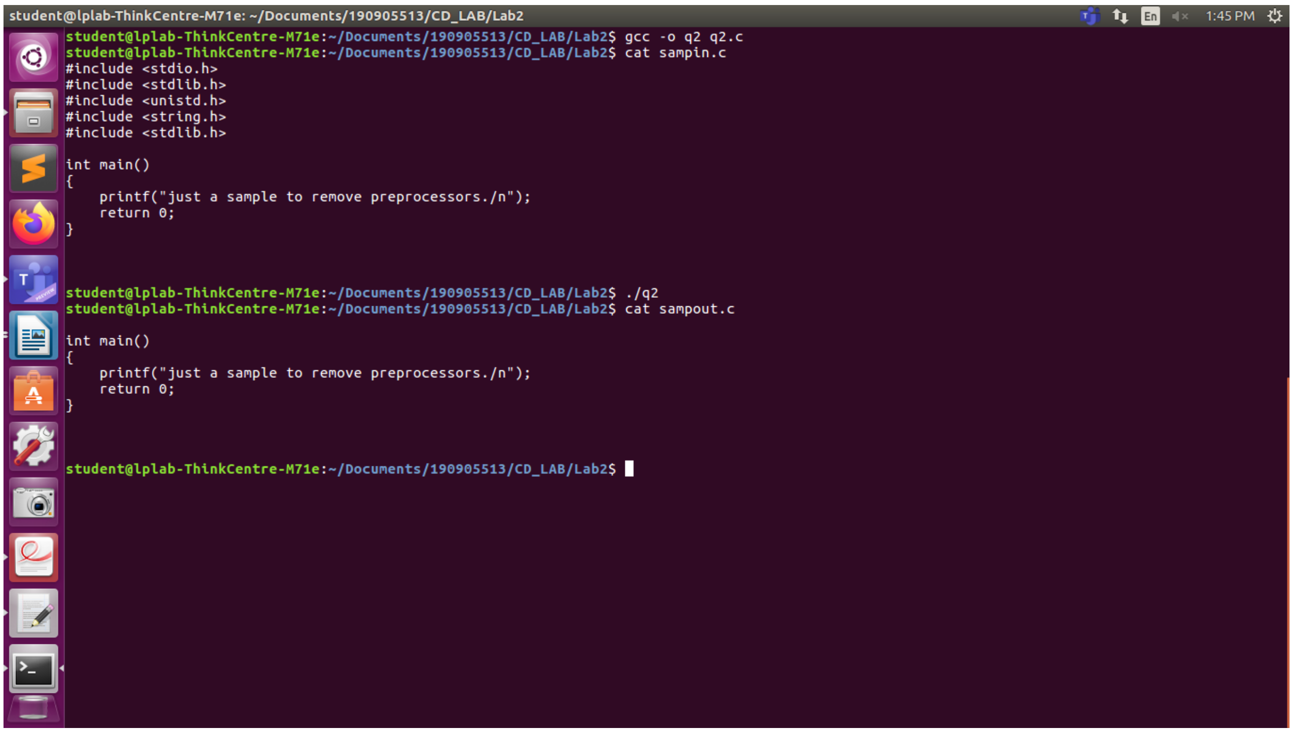
2. To discard preprocessor directives from the given input ‘C’ file.

Program:

```
/*Program to discard preprocessor directives from the given input
‘C’ file.*/
#include <stdio.h>
#include <string.h>
#include <unistd.h>
#include <stdlib.h>
#define FILEINPUT "sampin.c"
#define FILEOUTPUT "sampout.c"

const char *direct[] = {"#include","#define","#if"};

int is_directive(const char *str)
{
    for(int i = 0; i < sizeof(direct)/sizeof(char *); i++)
    {
        int len = strlen(direct[i]);

    if(strncmp(str, direct[i], len) == 0)
```

```
        {
            return 1;
        }
     }

    return 0;
}
int main()
{
    char buf[2048];
    FILE *f1,*f2;

  f1 = fopen(FILEINPUT, "r");
  f2 = fopen(FILEOUTPUT, "w");

  if(f1 == NULL || f2 == NULL)
  {
    perror("Files are missing..\n");
    return 1;
  }

  while(fgets(buf, 2048, f1) != NULL)
  {
        if(!is_directive(buf))
        {
            fputs(buf, f2);
        }
    }

  fclose(f1);
  fclose(f2);
  f1= fopen(FILEINPUT,"w");
  f2=fopen(FILEOUTPUT,"r");
  char copy;
  copy=getc(f2);

  while(copy!=EOF)
  {
    putc(copy,f1);
    copy=getc(f2);
  }

  fclose(f1);
  fclose(f2);

}
```

Output:



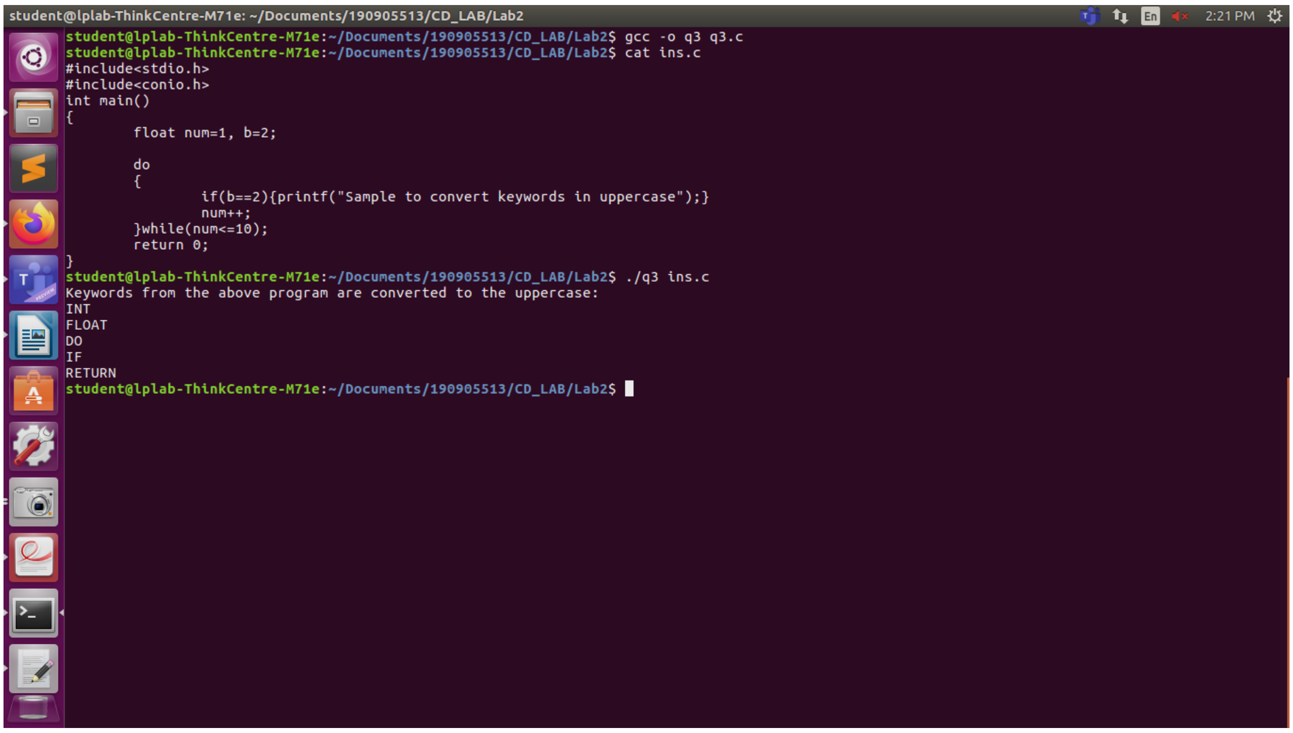
```
student@lplab-ThinkCentre-M71e: ~/Documents/190905513/CD_LAB/Lab2
student@lplab-ThinkCentre-M71e:~/Documents/190905513/CD_LAB/Lab2$ gcc -o q2 q2.c
student@lplab-ThinkCentre-M71e:~/Documents/190905513/CD_LAB/Lab2$ cat sampin.c
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
#include <string.h>
#include <stdlib.h>

int main()
{
    printf("just a sample to remove preprocessors./n");
    return 0;
}


student@lplab-ThinkCentre-M71e:~/Documents/190905513/CD_LAB/Lab2$ ./q2
student@lplab-ThinkCentre-M71e:~/Documents/190905513/CD_LAB/Lab2$ cat sampout.c

int main()
{
    printf("just a sample to remove preprocessors./n");
    return 0;
}


student@lplab-ThinkCentre-M71e:~/Documents/190905513/CD_LAB/Lab2$
```

3. That takes C program as input, recognizes all the keywords and prints them in upper case.

Program:

```
/*Program that takes C program as input, recognizes all the keywords and prints them in upper case.*/
#include <stdio.h>
#include <string.h>
#include <stdlib.h>
#include <ctype.h>
#include <stddef.h>

const char *keywords[15] = {
     "void","do","if","int","struct","break","else","switch",
     "case","return","for","static","while","default","float"
};

const char delimiters[]=" .,;:!-()\n\t";

int isKeyword (char *word) {
     int i;
     for (i = 0; i < 32; ++i) {
          if (strcmp(word, keywords[i]) == 0) {
               return 1;
          }
     }
     return 0;
}


void printUpperCase (char *word) {
     int l = strlen(word);
     char z;
     int i;
     for (i = 0; i < l; ++i) {
          z = word[i];
          printf("%c", z > 96 ? z - 32 : z);
     }
     printf("\n");
}

int main(int argc ,char **argv){


     FILE *fd1;

     fd1=fopen(argv[1],"r");
     printf("Keywords from the above program are converted to the
uppercase:\n");
     if(fd1==NULL){
          printf("Cannot open the file to read...\n");
          exit(0);
     }
     char buffer[1024];
     while(fgets(buffer,1024,fd1) >0){
          //temp copy of string
          char *cp =(char*)malloc(1024*sizeof(char));
          strcpy(cp,buffer);

          char *token=(char*)malloc(256*sizeof(char));
          do {
               token =strsep(&cp,delimiters);
               if(token!=NULL)
               {
                    if(isKeyword(token)){

                         printUpperCase(token);
                    }
               }
          }while(token!=NULL);
     }

     fclose(fd1);
     return 0;
}
```

Output:



student@lplab-ThinkCentre-M71e: ~/Documents/190905513/CD_LAB/Lab2
2:21 PM

```
student@lplab-ThinkCentre-M71e:~/Documents/190905513/CD_LAB/Lab2$ gcc -o q3 q3.c
student@lplab-ThinkCentre-M71e:~/Documents/190905513/CD_LAB/Lab2$ cat ins.c
#include<stdio.h>
#include<conio.h>
int main()
{
        float num=1, b=2;

        do
        {
                if(b==2){printf("Sample to convert keywords in uppercase");}
                num++;
        }while(num<=10);
        return 0;
}
student@lplab-ThinkCentre-M71e:~/Documents/190905513/CD_LAB/Lab2$ ./q3 ins.c
Keywords from the above program are converted to the uppercase:
INT
FLOAT
DO
IF
RETURN
student@lplab-ThinkCentre-M71e:~/Documents/190905513/CD_LAB/Lab2$ 
```