**ITU Faculty of Aeronautics and Astronautics**
**2016-2017 Spring Semester**
**BIL106E Introduction to Scientific and Engineering Computing - Fortran**

**HOMEWORK #2 – SOLUTION**

**PROBLEM:** A student of Aeronautics wants to write a fortran program that he will use for processing data of aircraft stored in a file, named "aircraft.dat". Each record in this file consist of a type name, year of manufacture and weight of an aircraft, as can be seen in Table 1. The data file contains only ten records since it is just for testing the program. The program must have the following features:

Read the data in the file and upon selecting one of the options "t", "y", and "w" save the data

- sorted on type name in increasing order in a new file "sorted_t.dat",
- sorted on year of manufacture in increasing order in a new file "sorted_y.dat",
- sorted on type name in increasing order in a new file "sorted_w.dat", respectively.

The file to be created for the case where sorting on year is chosen is shown in Table 2. In the output file data must be aligned in columns.

**Table 1.** Contenst of input file "aircraft.dat".

```
Aircraft        Year manufactured      Weight(kg)
----------      -------------------    ----------
Helicopter2  1984  6500
Airship       1935     215000
Airplane4  1970    170000
Helicopter1  1982    6000
Airplane3  1990  25000
Airplane1  1980 33000
Glider 1993    350
Seaplane  1960 11000
Balloon  1997 2000
Airplane2  1950 10000
```

**Table 2.** Contents of the output file "sorted_y.dat".

| Aircraft | Year manufactured | Weight(kg) |
|---|---|---|
| Airship | 1935 | 215000 |
| Airplane2 | 1950 | 10000 |
| Seaplane | 1960 | 11000 |
| Airplane4 | 1970 | 170000 |
| Airplane1 | 1980 | 33000 |
| Helicopter1 | 1982 | 6000 |
| Helicopter2 | 1984 | 6500 |
| Airplane3 | 1990 | 25000 |
| Glider | 1993 | 350 |
| Balloon | 1997 | 2000 |

**SOLUTION:**

```
program homework2
implicit none
integer :: i, j, n = 0, sel
character(len=60), dimension(2) :: rec
character(len=11) :: subrec(3:20, 3), temp(3)
character :: selection
character(len=12) :: filename

open(unit = 10, file ="aircraft.dat")
rewind(10)
do while (.not.EOF(10))
n = n + 1
if (n <= 2) then
read(10, "(a60)") rec(n)
else
read(10, *) subrec(n,:)
end if
end do

do
print "(1x, a27, \)", "Choose sort option (t/y/w):"
read *, selection
select case(selection)
case("t")
sel = 1
case("y")
sel = 2
case("w")
sel = 3
case default
cycle
end select
exit
end do
subrec(:,3) = adjustr(subrec(:,3))
filename = "sorted_"//selection//".dat"
open (11, file = filename)
write(11, "(a60)") rec
do i = 3, n
do j = i + 1, n
if (subrec(i,sel).gt.subrec(j,sel)) then
temp = subrec(i, :)
subrec(i, :) = subrec(j,:)
subrec(j,:) = temp
end if
end do
subrec(i,3) = adjustl(subrec(i,3))
write(11, "(a11, t23, a11, t48, a11)") subrec(i,:)
end do

end program homework2
```