

# "For those in peril on the Sea" - Extended Mission CS23710 2013

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## 1 Introduction

This document describes my design decisions for the Extended Mission. It also contains screenshots showing output of my netbeans project. As well as a sample of the logfile produced.

## 2 Design decisions.

### 2.1 Approach.

In order to be able to keep track of which rescue assets are busy, I decided to put an extra field in the structure of rescue assets. The field is of type struct time, and holds the time until a rescue asset is busy. Then when I assign a rescue asset for a mayday call I check that time. If the unit is free, the busy until field will always be less than the time of the mayday call. On the other hand if the time in which the rescue asset is busy is in the future, I must allocate another asset.

### 2.2 Changes from first program.

I have several changes between the two programs. In the extended version I have added the extra struct time as a field to the definition of struct rescue\_asset. Also, when I load rescue\_assets, I initialize the busy\_until fields' to zeroes. And in case I allocate a rescue asset, and send it somewhere to help, I calculate the time until it will be busy. So when my algorithm goes back and tries to allocate that ship, it will skip it since it's busy.

## 3 NetBeans output

### 3.1 Build project

```
19 }
20 /* Define the array pointer */
21 rescue_asset *assets;
22 /* Try to load. If load succeeds the assets pointer
23  * will point at the array of assets */
24 if(load_rescue_assets(resc_ass_file,num_assets,&assets) != SUCCESS_LOAD ) {
25     return 0;
```

Output x

C\_assignment\_2013 (Clean, Build) x C\_assignment\_2013 (Build, Run) x C\_assignment\_2013 (Run) x C\_assignment\_2013 (E

```
"/usr/bin/make" -f nbproject/Makefile-Debug.mk QMAKE= SUBPROJECTS= .build-conf
make[1]: Entering directory '/home/evdjoint/NetBeansProjects/C_assignment_2013'
"/usr/bin/make" -f nbproject/Makefile-Debug.mk dist/Debug/GNU-Linux-x86/C_assignment_2013
make[2]: Entering directory '/home/evdjoint/NetBeansProjects/C_assignment_2013'
make[2]: 'dist/Debug/GNU-Linux-x86/C_assignment_2013' is up to date.
make[2]: Leaving directory '/home/evdjoint/NetBeansProjects/C_assignment_2013'
make[1]: Leaving directory '/home/evdjoint/NetBeansProjects/C_assignment_2013'

BUILD SUCCESSFUL (total time: 61ms)
```

wri... C\_assignment\_... C\_assignment\_... C\_assignment\_... log.txt (~/C\_ass... Downloads 100%

### 3.2 Data files 1

Output x

C\_assignment\_2013 (Build) x C\_assignment\_2013 (Build, Run) x C\_assignment\_2013 (Run) x

```
Enter the rescue assets file :
/home/evdjoint/rescue_assets.txt
Enter the ships file :
/home/evdjoint/ships_1.txt
Enter the mayday calls file :
/home/evdjoint/mayday_1.txt

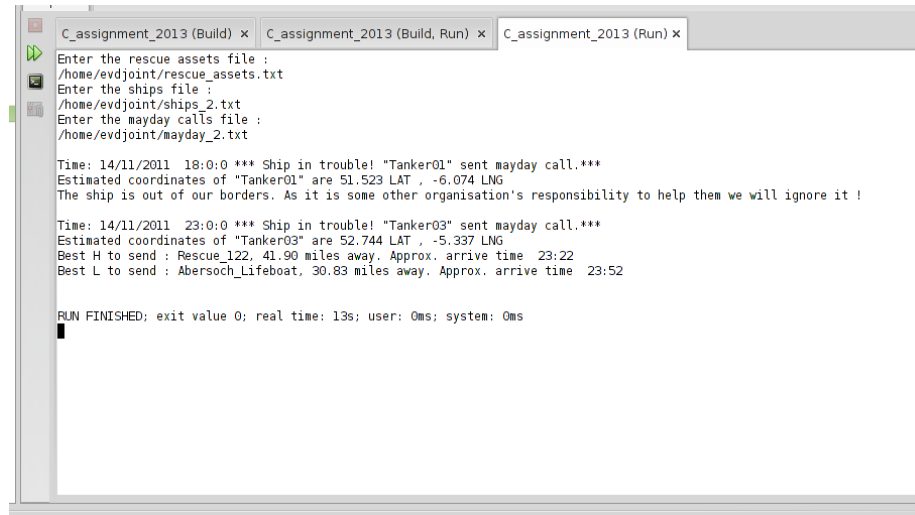
Time: 13/11/2011 13:10:0 *** Ship in trouble! "GS452" sent mayday call.***
Estimated coordinates of "GS452" are 51.767 LAT , -4.298 LNG
Best H to send : Rescue_169, 41.18 miles away. Approx. arrive time 13:32
Best L to send : Cardigan_Lifeboat, 24.21 miles away. Approx. arrive time 13:51

Time: 13/11/2011 15:14:23 *** Ship in trouble! "EI597" sent mayday call.***
Estimated coordinates of "EI597" are 52.100 LAT , -5.295 LNG
Best H to send : Rescue_117, 66.25 miles away. Approx. arrive time 15:47
Best L to send : Fishguard_ILB, 12.88 miles away. Approx. arrive time 15:44

Time: 13/11/2011 15:34:35 *** Ship in trouble! "EI600" sent mayday call.***
Estimated coordinates of "EI600" are 52.616 LAT , -5.724 LNG
Best H to send : Rescue_116, 52.23 miles away. Approx. arrive time 16:00
Best L to send : Courtown_ILB, 18.20 miles away. Approx. arrive time 16:17

RUN FINISHED; exit value 0; real time: 41s; user: 0ms; system: 0ms
```

### 3.3 Data files 2



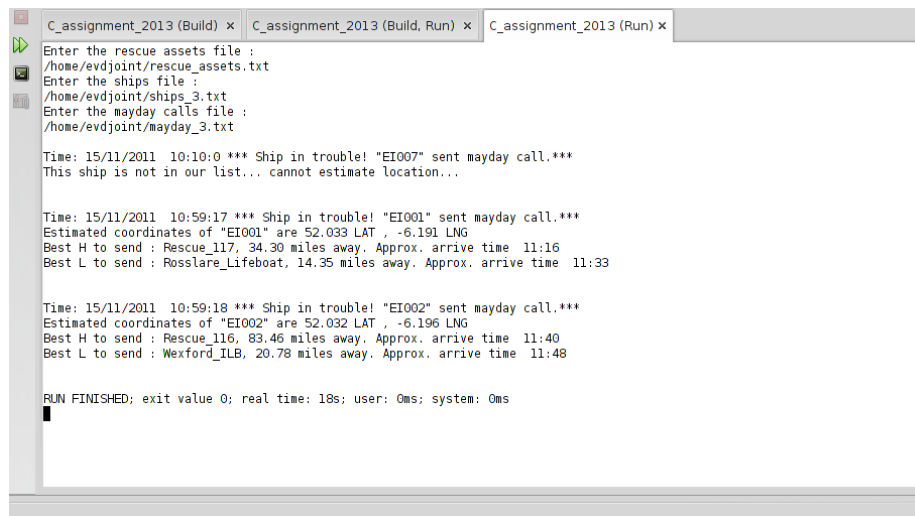
```
C_assignment_2013 (Build) x C_assignment_2013 (Build, Run) x C_assignment_2013 (Run) x
Enter the rescue assets file :
/home/evdjoint/rescue_assets.txt
Enter the ships file :
/home/evdjoint/ships_2.txt
Enter the mayday calls file :
/home/evdjoint/mayday_2.txt

Time: 14/11/2011 18:0:0 *** Ship in trouble! "Tanker01" sent mayday call.***
Estimated coordinates of "Tanker01" are 51.523 LAT , -6.074 LNG
The ship is out of our borders. As it is some other organisation's responsibility to help them we will ignore it !

Time: 14/11/2011 23:0:0 *** Ship in trouble! "Tanker03" sent mayday call.***
Estimated coordinates of "Tanker03" are 52.744 LAT , -5.337 LNG
Best H to send : Rescue_122, 41.90 miles away. Approx. arrive time 23:22
Best L to send : Abersoch_Lifeboat, 30.83 miles away. Approx. arrive time 23:52

RUN FINISHED; exit value 0; real time: 13s; user: 0ms; system: 0ms
```

### 3.4 Data files 3



```
C_assignment_2013 (Build) x C_assignment_2013 (Build, Run) x C_assignment_2013 (Run) x
Enter the rescue assets file :
/home/evdjoint/rescue_assets.txt
Enter the ships file :
/home/evdjoint/ships_3.txt
Enter the mayday calls file :
/home/evdjoint/mayday_3.txt

Time: 15/11/2011 10:10:0 *** Ship in trouble! "EI007" sent mayday call.***
This ship is not in our list... cannot estimate location...

Time: 15/11/2011 10:59:17 *** Ship in trouble! "EI001" sent mayday call.***
Estimated coordinates of "EI001" are 52.033 LAT , -6.191 LNG
Best H to send : Rescue_117, 34.30 miles away. Approx. arrive time 11:16
Best L to send : Rosslare_Lifeboat, 14.35 miles away. Approx. arrive time 11:33

Time: 15/11/2011 10:59:18 *** Ship in trouble! "EI002" sent mayday call.***
Estimated coordinates of "EI002" are 52.032 LAT , -6.196 LNG
Best H to send : Rescue_116, 83.46 miles away. Approx. arrive time 11:40
Best L to send : Wexford_ILB, 20.78 miles away. Approx. arrive time 11:48

RUN FINISHED; exit value 0; real time: 18s; user: 0ms; system: 0ms
```

### 3.5 Data files 4

```
C_assignment_2013 (Build) x C_assignment_2013 (Build, Run) x C_assignment_2013 (Run) x
Enter the rescue assets file :
/home/evdjoint/rescue_assets.txt
Enter the ships file :
/home/evdjoint/ships_4.txt
Enter the mayday calls file :
/home/evdjoint/mayday_4.txt

Time: 16/11/2011 10:30:0 *** Ship in trouble! "Cargo02" sent mayday call.***
Estimated coordinates of "Cargo02" are 52.610 LAT , -5.725 LNG
Best H to send : Rescue_116, 52.51 miles away. Approx. arrive time 10:56
Best L to send : Courtown_ILB, 18.18 miles away. Approx. arrive time 11:13

Time: 16/11/2011 11:30:0 *** Ship in trouble! "Rowing02" sent mayday call.***
Estimated coordinates of "Rowing02" are 52.641 LAT , -5.961 LNG
Best H to send : Rescue_117, 49.44 miles away. Approx. arrive time 11:54
Best L to send : Arklow_Lifeboat, 11.15 miles away. Approx. arrive time 11:56

Time: 16/11/2011 11:30:0 *** Ship in trouble! "Rowing03" sent mayday call.***
Estimated coordinates of "Rowing03" are 52.644 LAT , -5.961 LNG
Best H to send : Rescue_122, 63.05 miles away. Approx. arrive time 12:03
Best L to send : Wicklow_ILB, 20.17 miles away. Approx. arrive time 12:18

RUN FINISHED; exit value 0; real time: 22s; user: 0ms; system: 0ms
```

### 3.6 Data files 5

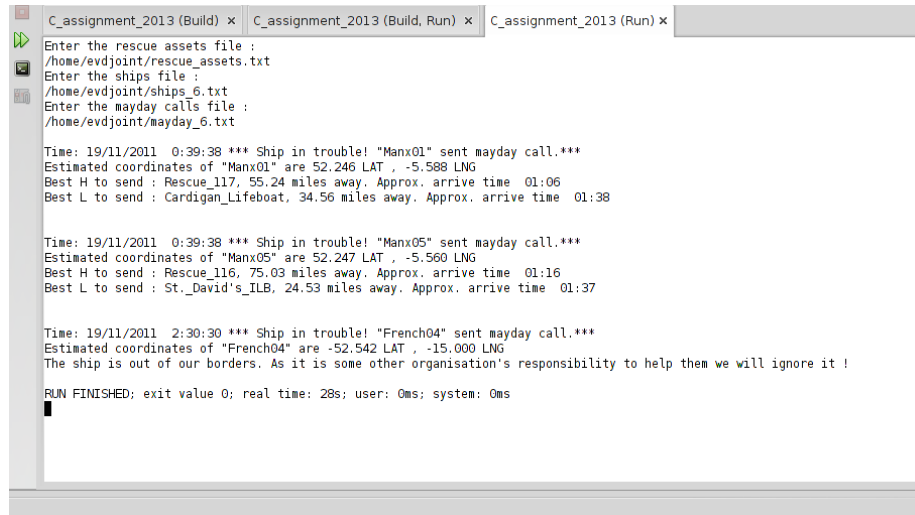
```
C_assignment_2013 (Build) x C_assignment_2013 (Build, Run) x C_assignment_2013 (Run) x
Enter the rescue assets file :
/home/evdjoint/rescue_assets.txt
Enter the ships file :
/home/evdjoint/ships_5.txt
Enter the mayday calls file :
/home/evdjoint/mayday_5.txt

Time: 17/11/2011 10:18:0 *** Ship in trouble! "Yacht04" sent mayday call.***
Estimated coordinates of "Yacht04" are 52.437 LAT , -4.272 LNG
Best H to send : Rescue_122, 49.62 miles away. Approx. arrive time 10:44
Best L to send : Aberystwyth_Lifeboat, 6.99 miles away. Approx. arrive time 10:29

Time: 17/11/2011 10:32:0 *** Ship in trouble! "Patches" sent mayday call.***
Estimated coordinates of "Patches" are 52.429 LAT , -4.272 LNG
Best H to send : Rescue_169, 80.70 miles away. Approx. arrive time 11:15
Best L to send : Aberystwyth_Arancia, 6.87 miles away. Approx. arrive time 10:47

RUN FINISHED; exit value 0; real time: 15s; user: 0ms; system: 0ms
```

### 3.7 Data files 6



```
C_assignment_2013 (Build) x C_assignment_2013 (Build, Run) x C_assignment_2013 (Run) x
Enter the rescue assets file :
/home/evdjoint/rescue_assets.txt
Enter the ships file :
/home/evdjoint/ships_6.txt
Enter the mayday calls file :
/home/evdjoint/mayday_6.txt

Time: 19/11/2011 0:39:38 *** Ship in trouble! "Manx01" sent mayday call.***
Estimated coordinates of "Manx01" are 52.246 LAT , -5.588 LNG
Best H to send : Rescue_117, 55.24 miles away. Approx. arrive time 01:06
Best L to send : Cardigan_Lifeboat, 34.56 miles away. Approx. arrive time 01:38

Time: 19/11/2011 0:39:38 *** Ship in trouble! "Manx05" sent mayday call.***
Estimated coordinates of "Manx05" are 52.247 LAT , -5.560 LNG
Best H to send : Rescue_116, 75.03 miles away. Approx. arrive time 01:16
Best L to send : St._David's_ILB, 24.53 miles away. Approx. arrive time 01:37

Time: 19/11/2011 2:30:30 *** Ship in trouble! "French04" sent mayday call.***
Estimated coordinates of "French04" are -52.542 LAT , -15.000 LNG
The ship is out of our borders. As it is some other organisation's responsibility to help them we will ignore it !

RUN FINISHED; exit value 0; real time: 28s; user: 0ms; system: 0ms
```

### 3.8 Log file sample

Time: 16/11/2011 11:30:0 \*\*\* Ship in trouble! "Rowing02" sent mayday call.\*\*\*  
Estimated coordinates of "Rowing02" are 52.640999 LAT , -5.960804 LNG  
Best H to send : Rescue\_117, 49.44 miles away. Approx. arrive time 11:54  
Best L to send : Arklow\_Lifeboat, 11.15 miles away. Approx. arrive time 11:56

Time: 16/11/2011 11:30:0 \*\*\* Ship in trouble! "Rowing03" sent mayday call.\*\*\*  
Estimated coordinates of "Rowing03" are 52.644411 LAT , -5.961343 LNG  
Best H to send : Rescue\_122, 63.05 miles away. Approx. arrive time 12:03  
Best L to send : Wicklow\_ILB, 20.17 miles away. Approx. arrive time 12:18

Time: 19/11/2011 0:39:38 \*\*\* Ship in trouble! "Manx01" sent mayday call.\*\*\*  
Estimated coordinates of "Manx01" are 52.245694 LAT , -5.588304 LNG  
Best H to send : Rescue\_117, 55.24 miles away. Approx. arrive time 01:06  
Best L to send : Cardigan\_Lifeboat, 34.56 miles away. Approx. arrive time 01:38

Time: 19/11/2011 0:39:38 \*\*\* Ship in trouble! "Manx05" sent mayday call.\*\*\*  
Estimated coordinates of "Manx05" are 52.247347 LAT , -5.559927 LNG  
Best H to send : Rescue\_116, 75.03 miles away. Approx. arrive time 01:16  
Best L to send : St.\_David's\_ILB, 24.53 miles away. Approx. arrive time 01:37