

LHospital

A *Turbo* C++ project

A basic management system for a general hospital

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C++ files (.cpp)

1. code/iface3.cpp

```
1  #include <fstream.h>
2  #include "base.hpp"
3  #include "iface.hpp"
4  #include "hosp.hpp"
5  #include "emp.hpp"
6
7  void interface::employee_management()
8  {
9      const int menu_corner_top_left_y = 5;
10     coord c(ui::scr.width * 0.2, menu_corner_top_left_y);
11     int ch;
12     while(1)
13     {
14         interface::clear_error();
15         box menu(c, ui::scr.width * 0.6, ui::scr.height - 6 );
16         menu.settcolor(GREEN);
17         menu << ui::centeralign << "Employee Management" << ui::endl << ui::endl;
18         menu.settcolor(ui::tcolor);
19         menu << "1. View employee data" << ui::endl
20             << "2. Add new employee" << ui::endl
21             << "3. Remove existing employee" << ui::endl
22             << "4. Edit employee data" << ui::endl
23             << "5. Pay salary to individual employee" << ui::endl
24             << "6. Pay salary to all employees" << ui::endl
25             << "7. Back" << ui::endl
26             << ui::endl << "Enter your choice: ";
27         menu.settcolor_input(YELLOW);
28         validate_menu::set_menu_limits(1, 7);
29         menu >> validate_menu::input >> ch;
30         menu << ui::endl;
31         menu.setexit_button("Submit");
32         menu.loop();
33         menu.hide();
34         switch (ch)
35         {
36             case 1:
37             {
38                 emp_mgmt::view_emp();
39                 break;
40             }
41             case 2:
42             {
43                 emp_mgmt::add_emp();
44                 break;
45             }
46             case 3:
47             {
48                 emp_mgmt::remove_emp();
49                 break;
50             }
51             case 4:
52             {
53                 emp_mgmt::edit_emp();
54                 break;
```

```

55         }
56         case 5:
57         {
58             emp_mgmt::pay_emp();
59             break;
60         }
61         case 6:
62         {
63             emp_mgmt::pay_all();
64             break;
65         }
66         case 7:
67         {
68             return;
69         }
70     }
71 }
72 }
73
74 void interface::employee_screen(unsigned long id)
75 {
76     void * temp = malloc( sizeof(doctor) ); //as doctor has the greatest size
77     among employee, doctor, nurse and receptionist classes
78     if(temp == NULL)
79     {
80         interface::log_this("interface::employee_screen() : Not enough memory to
81         allocate buffer void * temp = malloc( sizeof(doctor) );");
82         interface::error("Out of memory!! Check log");
83         getch();
84         return;
85     }
86     if(!hospital::get_employee_by_id(id, temp))
87     {
88         interface::error("ID not found or error while reading from file!");
89         getch();
90         free(temp);
91         return;
92     }
93     employee *e = (employee *) temp;
94     const int menu_corner_top_left_y = 5;
95     coord c(ui::scr.width * 0.2, menu_corner_top_left_y);
96     int ch;
97     str heading = "Welcome, ";
98     strcat( heading, e->get_name() );
99     strcat(heading, "!");
100    while(1)
101    {
102        interface::clear_error();
103        box menu(c, ui::scr.width * 0.6, ui::scr.height - 6 );
104        menu.settcolor(GREEN);
105        menu << ui::centeralign << heading << ui::endl << ui::endl;
106        menu.settcolor(ui::tcolor);
107        menu << "1. View profile" << ui::endl
108            << "2. Change login details" << ui::endl
109            << "3. View last 5 transactions" << ui::endl;
110        emp_type type_of_emp = id_to_emp::convert(id);
111        if(type_of_emp == RECEPTIONIST)
112        {
113            menu << "4. Manage patients" << ui::endl

```

```

112         << "5. Exit" << ui::endl;
113     }
114     else
115     {
116         menu << "4. Exit" << ui::endl;
117     }
118     menu << ui::endl << "Enter your choice: ";
119     menu.settcolor_input(YELLOW);
120     if(type_of_emp == RECEPTIONIST)
121     {
122         validate_menu::set_menu_limits(1, 5);
123     }
124     else
125     {
126         validate_menu::set_menu_limits(1, 4);
127     }
128     menu >> validate_menu::input >> ch;
129     menu << ui::endl;
130     menu.setexit.button("Submit");
131     menu.loop();
132     menu.hide();
133     switch(ch)
134     {
135         case 1:
136         {
137             if( !emp_mgmt::view_emp(id) )
138             {
139                 interface::error("Failed to display profile!");
140                 getch();
141             }
142             break;
143         }
144         case 2:
145         {
146             int ch;
147             while(1)
148             {
149                 box menu3(c, ui::scr_width * 0.6, ui::scr_height - 6);
150                 menu3.settcolor(GREEN);
151                 menu3 << ui::centeralign << "Change login details" << ui::
152                     endl << ui::endl;
153                 menu3.settcolor(WHITE);
154                 menu3 << "1. Change User ID" << ui::endl
155                     << "2. Change Password" << ui::endl
156                     << "3. Back" << ui::endl
157                     << "Enter your choice: ";
158                 menu3.settcolor(ui::tcolor);
159                 menu3.settcolor_input(YELLOW);
160                 validate_menu::set_menu_limits(1, 3);
161                 menu3 >> validate_menu::input >> ch;
162                 menu3 << ui::endl;
163                 menu3.setexit.button("Submit");
164                 menu3.loop();
165                 menu3.hide();
166                 switch(ch)
167                 {
168                     case 1:
169                     {
170                         str new_username;

```

```

170         box menu4( menu3.getcorner_top_left(), menu3.getwidth
171             (), menu3.getheight() );
172         menu4.settcolor(GREEN);
173         menu4 << ui::centeralign << "Change login details" <<
174             ui::endl << ui::endl;
175         menu4.settcolor(WHITE);
176         menu4 << "Change User ID" << ui::endl;
177         menu4.settcolor(ui::tcolor);
178         menu4 << "User ID: ";
179         menu4.setdefault( e->account.get_username() );
180         menu4.settcolor_input(YELLOW);
181         menu4 >> new_username;
182         menu4.setexit_button("Submit");
183         menu4.setback_func(back_func::set_backbit);
184         menu4.loop();
185         menu4.hide();
186         if(back_func::backbit)
187         {
188             back_func::backbit = 0;
189             break;
190         }
191         e->account.set_username(new_username);
192         const int notice_height = 10;
193         box notice( menu4.getcorner_top_left(), menu4.
194             getwidth(), notice_height );
195         notice.settcolor(GREEN);
196         notice << ui::centeralign << "Change login details"
197             << ui::endl << ui::endl;
198         if( !hospital::write_employee(temp) )
199         {
200             notice.settcolor(RED);
201             notice << "Failed to write new user ID to file!
202                 Check log" << ui::endl;
203         }
204         else
205         {
206             notice.settcolor(GREEN);
207             notice << "User ID changed successfully!" << ui::
208                 endl;
209         }
210         notice.setexit_button("Back");
211         notice.loop();
212         notice.hide();
213         goto loop_exit;
214     }
215 case 2:
216 {
217     str curr_pwd, new_pwd;
218     for(int i = 0; i < 3; ++i)
219     {
220         box menu4( menu3.getcorner_top_left(), menu3.
221             getwidth(), menu3.getheight() );
222         menu4.settcolor(GREEN);
223         menu4 << ui::centeralign << "Change login details
224             " << ui::endl << ui::endl;
225         menu4.settcolor(WHITE);
226         menu4 << "Change Password" << ui::endl;
227         menu4.settcolor(ui::tcolor);
228         menu4 << "Enter current password: ";

```

```

221         menu4.settcolor_input(YELLOW);
222         menu4 >> box::setpassword >> curr_pwd;
223         menu4.setexit_button("Submit");
224         menu4.setback_func(back_func::set_backbit);
225         menu4.loop();
226         menu4.hide();
227         if(back_func::backbit)
228         {
229             break;
230         }
231         if( e->account.login(curr_pwd) )
232         {
233             interface::clear_error();
234             break;
235         }
236         interface::error("Invalid password!! Try again...
                ");
237     }
238     if(back_func::backbit)
239     {
240         back_func::backbit = 0;
241         break;
242     }
243     if(i == 3)
244     {
245         const int notice_height = 10;
246         box notice( menu3.getcorner_top_left(), menu3.
                getwidth(), notice_height);
247         notice.settcolor(GREEN);
248         notice << ui::centralalign << "Change login
                details" << ui::endl << ui::endl;
249         notice.settcolor(RED);
250         notice << "Since you entered the wrong password
                too many times, you have been logged out. "
251                 << "Hit the button below to exit the
                program." << ui::endl << ui::endl;
252         notice.setexit_button("Exit");
253         notice.loop();
254         notice.hide();
255         free(temp);
256         return;
257     }
258     box menu5( menu3.getcorner_top_left(), menu3.getwidth
                (), menu3.getheight() );
259     menu5.settcolor(GREEN);
260     menu5 << ui::centralalign << "Change login details" <<
                ui::endl << ui::endl;
261     menu5.settcolor(WHITE);
262     menu5 << "Change Password" << ui::endl;
263     menu5.settcolor(ui::tcolor);
264     menu5 << "Enter new password: ";
265     menu5.settcolor_input(YELLOW);
266     menu5 >> box::setpassword >> new_pwd;
267     menu5.setexit_button("Submit");
268     menu5.setback_func(back_func::set_backbit);
269     menu5.loop();
270     menu5.hide();
271     if(back_func::backbit)
272     {

```



```

273         back_func::backbit = 0;
274         break;           //At the "Enter new password" page,
                           when shift+bkspc is pressed, control will go
                           back to "Change login details" menu.
275     }
276     e->account = userid( e->account.get_username(),
                           new_pwd );
277     const int notice2_height = 13;
278     box notice2( menu3.getcorner_top_left(), menu3.
                           getwidth(), notice2_height );
279     notice2.settcolor(GREEN);
280     notice2 << ui::centeralign << "Change login details"
                           << ui::endl << ui::endl;
281     if( !hospital::write_employee(temp) )
282     {
283         notice2.settcolor(RED);
284         notice2 << "Failed to write new password to file!
                           Check log" << ui::endl;
285     }
286     else
287     {
288         notice2.settcolor(GREEN);
289         notice2 << "Password changed successfully!" << ui
                           ::endl;
290     }
291     notice2.settcolor(ui::tcolor);
292     notice2 << "Please logout and login again by exiting
                           the program and restarting it." << ui::endl
                           << "Press the button below to exit the
                           program." << ui::endl;
293     notice2.setexit_button("Exit");
294     notice2.loop();
295     notice2.hide();
296     free(temp);
297     return;
298 }
299
300 case 3:
301 {
302     goto loop_exit;
303 }
304 }
305 }
306 loop_exit:
307 break;
308 }
309 case 3:
310 {
311     transaction * t = e->get_last_5_transactions();
312     if( t == NULL )
313     {
314         interface::error("Error while reading or writing to file!
                           Check log");
315         getch();
316         break;
317     }
318     coord c2(1, 4);
319     box menu2(c2, (ui::scr_width / 2), ui::scr_height - 5);
320     box sidemenu(( c2 + coord((ui::scr_width / 2) - 1, 0)), (ui::
                           scr_width / 2) + 1, ui::scr_height - 5);

```

```

321     menu2.f << ( ui::top | ui::left ) << (char)204
322         << ( ui::bottom | ui::left ) << (char)204
323         << ( ui::top | ui::right ) << (char)203
324         << ( ui::bottom | ui::right ) << (char)202;
325     menu2.f.display();
326     sidemenu.f << ( ui::top | ui::left ) << (char)203
327         << ( ui::bottom | ui::left ) << (char)202
328         << ( ui::top | ui::right ) << (char)185
329         << ( ui::bottom | ui::right ) << (char)185;
330     sidemenu.f.display();
331     menu2.settcolor(GREEN);
332     menu2 << ui::centeralign << "View last 5 transactions" << ui::
333         endl << ui::endl;
334     menu2.settcolor(ui::tcolor);
335     for(int i = 0; i < 5; ++i)
336     {
337         if( t[i].amount == 0 && !strcmp(t[i].reason, "NA") &&
338             t[i].date.day == 0 && t[i].date.month == 0 && t[i].
339             date.year == 0
340             && t[i].time.hour == 25 && t[i].time.minute == 0 && t[i].
341             time.second == 0 )
342         {
343             break;
344         }
345         if(i < 3)
346         {
347             menu2 << i + 1 << ". " << t[i].date << ", " << t[i].
348             time << ui::endl
349             << "Amount: " << t[i].amount << ui::endl
350             << "Reason: " << t[i].reason << ui::endl;
351         }
352         else
353         {
354             sidemenu << i + 1 << ". " << t[i].date << ", " << t[i].
355             time << ui::endl
356             << "Amount: " << t[i].amount << ui::endl
357             << "Reason: " << t[i].reason << ui::endl;
358         }
359     }
360     free(t);
361     if(i <= 3)
362     {
363         menu2.setexit.button("Back");
364         menu2.loop();
365     }
366     else
367     {
368         sidemenu.setexit.button("Back");
369         sidemenu.loop();
370     }
371     menu2.hide();
372     sidemenu.hide();
373     window.f.display();
374     break;
375 }
376 case 4:
377 {
378     if(type_of_emp == RECEPTIONIST)
379     {

```

```

375         interface::patient_management();
376         break;
377     }
378     else
379     {
380         free(temp);
381         return;
382     }
383 }
384 case 5:
385 {
386     free(temp);
387     return;
388 }
389 }
390 }
391 }
392
393 emp_mgmt::emp_mgmt()
394 {}
395
396 void emp_mgmt::view_emp()
397 {
398     const int menu2_height = 10;
399     box menu2( coord(ui::scr_width * 0.2, 5), ui::scr_width * 0.6, menu2_height);
400     menu2.settcolor(GREEN);
401     menu2 << ui::centralalign << "Employee Management" << ui::endl << ui::endl;
402     menu2.settcolor(WHITE);
403     menu2 << "View employee data" << ui::endl;
404     menu2.settcolor(ui::tcolor);
405     menu2 << "Enter employee's id: ";
406     unsigned long id;
407     menu2.settcolor_input(YELLOW);
408     menu2 >> id;
409     menu2 << ui::endl;
410     menu2.setexit_button("Submit");
411     menu2.setback_func(back_func::set_backbit);
412     menu2.loop();
413     menu2.hide();
414     if(back_func::backbit)
415     {
416         back_func::backbit = 0;
417         return;
418     }
419     view_emp(id);
420 }
421
422 int emp_mgmt::view_emp(unsigned long id)
423 {
424     void * temp = malloc( sizeof(doctor) ); //as doctor has the greatest size
         among employee, doctor, nurse and receptionist classes
425     if(temp == NULL)
426     {
427         interface::log_this("emp_mgmt::view_emp(int) : Not enough memory to
            allocate buffer void * temp = malloc( sizeof(doctor) )");
428         interface::error("Out of memory!! Check log");
429         getch();
430         return 0;
431     }

```

```

432     if(!hospital::get_employee_by_id(id, temp))
433     {
434         interface::error("ID not found or error while reading from file!");
435         getch();
436         free(temp);
437         return 0;
438     }
439     employee *e = (employee *) temp;
440     box menu3( coord(ui::scr_width * 0.2, 5), ui::scr_width * 0.6, ui::scr_height
441               - 6 );
442     menu3.settcolor(GREEN);
443     menu3 << ui::centeralign << "Employee Management" << ui::endl << ui::endl;
444     menu3.settcolor(WHITE);
445     menu3 << "Employee Details: " << ui::endl;
446     menu3.settcolor(ui::tcolor);
447     menu3 << "ID: " << e->get_id() << ui::endl;
448     menu3 << "Name: " << e->get_name() << ui::endl;
449     menu3 << "Age: " << e->get_age() << ui::endl;
450     menu3 << "Sex: " << (sex)e->get_sex() << ui::endl;
451     menu3 << "Date of Birth: " << e->get_dob() << ui::endl;
452     menu3 << "Address: " << e->get_address() << ui::endl;
453     menu3 << "Phone no.: " << e->get_phone() << ui::endl;
454     menu3 << "Salary: " << e->get_salary() << ui::endl;
455     menu3 << "Shift timings: Starts - " << e->get_shift(START) << ui::endl;
456     menu3 << "_____: Ends - " << e->get_shift(END) << ui::endl;
457     switch( id_to_emp::convert( e->get_id() ) )
458     {
459         case INVALID:    //Test this case, menu3.hide() not working properly
460         {
461             menu3.clear();
462             int menu3.height = 9;
463             menu3.setheight(menu3.height);
464             menu3.settcolor(GREEN);
465             menu3 << ui::centeralign << "Employee Management" << ui::endl << ui::
466               endl;
467             menu3.settcolor(WHITE);
468             menu3 << "Employee Details: " << ui::endl;
469             menu3.settcolor(RED);
470             menu3 << "Invalid ID!!" << id_to_emp::convert( e->get_id() );
471             menu3.settcolor(ui::tcolor);
472             menu3.setexit_button("Back");
473             menu3.loop();
474             menu3.hide();
475             break;
476         }
477         case OTHERS:
478         case RECEPTIONIST: //there are no extra data members in class
479           receptionist
480         {
481             menu3.setexit_button("Back");
482             menu3.loop(); // menu3.clear(); int w = window.getwidth(), m =
483               menu3.getwidth(); menu3<<w<<' '<<m; getch();
484             menu3.hide();
485             break;
486         }
487         case DOCTOR:
488         {
489             doctor *d = (doctor *)temp;
490             menu3.hide();

```

```

487     menu3.setcorner_top_left( coord( 1, menu3.getcorner_top_left().y ) );
488     menu3.display();
489     menu3.f << ( ui::top | ui::left ) << (char)204
490         << ( ui::bottom | ui::left ) << (char)204;
491     menu3.f.display();
492     box sidemenu( menu3.getcorner_top_left() + coord( menu3.getwidth() -
        1, 0 ), ( ui::scr_width - menu3.getwidth() + 1 ), menu3.getheight
        ( ) );
493     sidemenu.f << ( ui::top | ui::left ) << (char)203
494         << ( ui::bottom | ui::left ) << (char)202
495         << ( ui::top | ui::right ) << (char)185
496         << ( ui::bottom | ui::right ) << (char)185;
497     sidemenu.f.display();
498     sidemenu << "Speciality(s)" << ui::endl;
499     for(int i = 0; i < 2 && d->get_speciality()[i] <= GEN; ++i)
500     {
501         sidemenu << i + 1 << ". " << (body_parts)d->get_speciality()[i]
            << ui::endl;
502     }
503     if(!i)
504     {
505         sidemenu << "None" << ui::endl;
506     }
507     sidemenu << "Patients currently under care:" << ui::endl;
508     for(i = 0; d->get_patients()[i] && i < 10; ++i)
509     {
510         sidemenu << i + 1 << ". " << hospital::get_patient_by_id( d->
            get_patients()[i] ).get_name() << ui::endl;
511     }
512     if(!i)
513     {
514         sidemenu << "None" << ui::endl;
515     }
516     sidemenu.setexit_button("Back");
517     sidemenu.loop();
518     menu3.hide();
519     sidemenu.hide();
520     window.f.display();
521     break;
522 }
523 case NURSE:
524 {
525     nurse *n = (nurse *)temp;
526     menu3.hide();
527     menu3.setcorner_top_left( coord( 1, menu3.getcorner_top_left().y ) );
528     menu3.display();
529     menu3.f << ( ui::top | ui::left ) << (char)204
530         << ( ui::bottom | ui::left ) << (char)204;
531     menu3.f.display();
532     box sidemenu( menu3.getcorner_top_left() + coord( menu3.getwidth() -
        1, 0 ), ( ui::scr_width - menu3.getwidth() + 1 ), menu3.getheight
        ( ) );
533     sidemenu.f << ( ui::top | ui::left ) << (char)203
534         << ( ui::bottom | ui::left ) << (char)202
535         << ( ui::top | ui::right ) << (char)185
536         << ( ui::bottom | ui::right ) << (char)185;
537     sidemenu.f.display();
538     sidemenu << "Patients currently under care:" << ui::endl;
539     for(int i = 0; n->get_patients()[i] && i < 5; ++i)

```

```

540         {
541             sidemenu << i + 1 << ". " << hospital::get_patient_by_id( n->
                get_patients()[i] ).get_name() << ui::endl;
542         }
543         if(!i)
544         {
545             sidemenu << "None" << ui::endl;
546         }
547         sidemenu.setexit_button("Back");
548         sidemenu.loop();
549         menu3.hide();
550         sidemenu.hide();
551         window.f.display();
552         break;
553     }
554 }
555 free(temp);
556 return 1;
557 }
558
559 void emp_mgmt::add_emp()
560 {
561     int ch;
562     str name, dob_str, adr_hno, adr_street, adr_city, adr_dist, adr_state,
        shift_start_str, shift_end_str, uid, pwd;
563     unsigned sex_choice;
564     Date dob;
565     address adr;
566     phone phn_no;
567     unsigned long salary;
568     Time shift_start, shift_end;
569     int speciality[2];
570     const coord menu2_corner_top_left = coord(ui::scr_width * 0.2, 5);
571     const int menu2_width = ui::scr_width * 0.6;
572     menu2:
573     {
574         const int menu2_height = 17;
575         box menu2(menu2_corner_top_left, menu2_width, menu2_height);
576         menu2.settcolor(GREEN);
577         menu2 << ui::centeralign << "Employee Management" << ui::endl << ui::endl
            ;
578         menu2.settcolor(WHITE);
579         menu2 << "Add new employee" << ui::endl;
580         menu2.settcolor(ui::tcolor);
581         menu2 << "Step 1: Select employee type" << ui::endl << ui::endl
            << "1. Doctor" << ui::endl
582             << "2. Nurse" << ui::endl
583             << "3. Receptionist" << ui::endl
584             << "4. Others" << ui::endl << ui::endl
585             << "Enter your choice: ";
586         validate_menu::set_menu_limits(1, 4);
587         menu2.settcolor_input(YELLOW);
588         menu2 >> validate_menu::input >> ch;
589         menu2 << ui::endl;
590         menu2.setexit_button("Submit");
591         menu2.setback_func(back_func::set_backbit);
592         menu2.loop();
593         menu2.hide();
594         if(back_func::backbit)

```

```

596     {
597         back_func::backbit = 0;
598         return;
599     }
600 }
601 menu3:
602 {
603     box menu3( menu2_corner_top_left, menu2_width, ui::scr_height - 6 );
604     menu3.settcolor(GREEN);
605     menu3 << ui::centralalign << "Employee Management" << ui::endl << ui::endl
606     ;
607     menu3.settcolor(WHITE);
608     menu3 << "Add new employee" << ui::endl;
609     menu3.settcolor(ui::tcolor);
610     menu3 << "Step 2: Add employee details" << ui::endl << ui::endl;
611     menu3.settcolor_input(YELLOW);
612     menu3 << "Name: ";
613     menu3 >> name;
614     menu3 << "Sex: 1. Male | 2. Female | 3. Transsexual" << ui::endl
615     << "—— Enter your choice: ";
616     validate_menu::set_menu_limits(1, 3);
617     menu3 >> validate_menu::input >> (int)sex_choice;
618     menu3 << "Date of Birth(DD/MM/YYYY): ";
619     menu3 >> hospital::date_validity >> dob_str;
620     menu3 << "Address: " << ui::endl;
621     menu3 << (char)26 << "House no.: ";
622     menu3 >> adr_hno;
623     menu3 << (char)26 << "Street: ";
624     menu3 >> adr_street;
625     menu3 << (char)26 << "City: ";
626     menu3 >> adr_city;
627     menu3 << (char)26 << "District: ";
628     menu3 >> adr_dist;
629     menu3 << (char)26 << "State: ";
630     menu3 >> adr_state;
631     menu3 << "Phone no.: ";
632     menu3 >> phn_no;
633     menu3 << "Salary: ";
634     menu3 >> salary;
635     menu3 << "Shift timings: Starts - (HH:MM:SS)";
636     menu3 >> hospital::time_validity >> shift_start_str;
637     menu3 << "—————: Ends - (HH:MM:SS)";
638     menu3 >> hospital::time_validity >> shift_end_str;
639     menu3.setexit_button("Submit");
640     menu3.setback_func(back_func::set_backbit);
641     menu3.loop();
642     menu3.hide();
643     if(back_func::backbit)
644     {
645         back_func::backbit = 0;
646         goto menu2;
647     }
648     —sex_choice;
649     dob = hospital::str_to_date(dob_str);
650     adr = address(adr_hno, adr_street, adr_city, adr_dist, adr_state);
651     shift_start = hospital::str_to_time(shift_start_str);
652     shift_end = hospital::str_to_time(shift_end_str);
653 }
menu4:

```

```

654
655 if(ch != 4)
656 {
657     box menu4( menu2.corner_top_left, menu2.width, ui::scr_height - 6 );
658     menu4.settcolor(GREEN);
659     menu4 << ui::centeralign << "Employee Management" << ui::endl << ui::endl
        ;
660     menu4.settcolor(WHITE);
661     menu4 << "Add new employee" << ui::endl;
662     menu4.settcolor(ui::tcolor);
663     menu4.settcolor_input(YELLOW);
664     menu4 << "Step 3: Add login details" << ui::endl << ui::endl;
665     menu4 << "User ID: ";
666     menu4 >> uid;
667     menu4 << "Password: ";
668     menu4 >> box::setpassword >> pwd;
669     menu4 << ui::endl;
670     menu4.setexit_button("Submit");
671     menu4.setback_func(back_func::set_backbit);
672     menu4.loop();
673     menu4.hide();
674 }
675 if(back_func::backbit)
676 {
677     back_func::backbit = 0;
678     goto menu3;
679 }
680 if(ch == 1)
681 {
682     coord c(1, 4);
683     box menu5(c, (ui::scr_width / 2), ui::scr_height - 5);
684     box inp_box(( c + coord((ui::scr_width / 2) - 1, 0)), (ui::scr_width / 2)
        + 1, ui::scr_height - 5);
685     menu5.f << ( ui::top | ui::left ) << (char)204
686         << ( ui::bottom | ui::left ) << (char)204
687         << ( ui::top | ui::right ) << (char)203
688         << ( ui::bottom | ui::right ) << (char)202;
689     menu5.f.display();
690     inp_box.f << ( ui::top | ui::left ) << (char)203
691         << ( ui::bottom | ui::left ) << (char)202
692         << ( ui::top | ui::right ) << (char)185
693         << ( ui::bottom | ui::right ) << (char)185;
694     inp_box.f.display();
695     menu5 << ui::centeralign << "Employee Management" << ui::endl << ui::endl
        ;
696     menu5.settcolor(WHITE);
697     menu5 << "Add new employee" << ui::endl;
698     menu5.settcolor(ui::tcolor);
699     menu5 << "Step 4: Add doctor details" << ui::endl << ui::endl;
700     menu5 << "Specialization of doctor (max 2)" << ui::endl
701         << "Choose from the following list: " << ui::endl;
702     for(int i = 0; i <= GEN; ++i)
703     {
704         if(i <= 8)
705         {
706             menu5 << i << ". " << (body-parts)i << ui::endl;
707         }
708         else
709         {

```



```

710         inp_box << i << ". " << (body_parts)i << ui::endl;
711     }
712 }
713 inp_box.settcolor_input(YELLOW);
714 inp_box << "Enter the number corresponding to the required entry in the 2
       fields below" << ui::endl;
715 validate_menu::set_menu_limits(BRAIN, GEN);
716 inp_box << (char)26;    inp_box >> validate_menu::input >> speciality[0];
717 inp_box << (char)26;    inp_box >> validate_menu::input >> speciality[1];
718 inp_box << ui::endl;
719 inp_box.setexit_button("Submit");
720 inp_box.setback_func(back_func::set_backbit);
721 inp_box.loop();
722 menu5.hide();
723 inp_box.hide();
724 window.f.display();
725 }
726 if(back_func::backbit)
727 {
728     back_func::backbit = 0;
729     goto menu4;
730 }
731 void * temp = NULL;
732 unsigned long id;
733 switch (ch)
734 {
735     case 1:
736     {
737         doctor x(name, sex_choice, dob, adr, phn_no, salary, shift_start,
                   shift_end, speciality[0], speciality[1], uid, pwd);
738         temp = &x;
739         id = x.get_id();
740         break;
741     }
742     case 2:
743     {
744         nurse x(name, sex_choice, dob, adr, phn_no, salary, shift_start,
                  shift_end, uid, pwd);
745         temp = &x;
746         id = x.get_id();
747         break;
748     }
749     case 3:
750     {
751         receptionist x(name, sex_choice, dob, adr, phn_no, salary,
                          shift_start, shift_end, uid, pwd);
752         temp = &x;
753         id = x.get_id();
754         break;
755     }
756     case 4:
757     {
758         employee x(name, sex_choice, dob, adr, phn_no, salary, shift_start,
                     shift_end);
759         temp = &x;
760         id = x.get_id();
761         break;
762     }
763 }

```

```

764     const int notice.height = 12;
765     box notice( menu2.corner.top_left, menu2.width, notice.height );
766     notice.settcolor(GREEN);
767     notice << ui::centralalign << "Employee Management" << ui::endl << ui::endl;
768     if(!hospital::write_employee(temp))
769     {
770         notice.settcolor(RED);
771         notice << "Employee addition unsuccessful!!";
772         notice.setexit_button("Exit");
773         notice.loop();
774         notice.hide();
775         return;
776     }
777     notice << "Employee added successfully!!" << ui::endl;
778     notice.settcolor(WHITE);
779     notice << "Hit the button below to display the details you entered: " << ui::
780         endl;
781     notice.settcolor(ui::tcolor);
782     notice << ui::endl;
783     notice.setexit_button("View employee...");
784     notice.loop();
785     notice.hide();
786     view_emp(id);
787 }
788 void emp_mgmt::remove_emp()
789 {
790     const coord menu2.corner.top_left = coord(ui::scr_width * 0.2, 5);
791     const int menu2.width = ui::scr_width * 0.6;
792     unsigned long id;
793     char ch;
794     menu2:
795     {
796         const int menu2.height = 10;
797         box menu2(menu2.corner.top_left, menu2.width, menu2.height);
798         menu2.settcolor(GREEN);
799         menu2 << ui::centralalign << "Employee Management" << ui::endl << ui::endl
800             ;
801         menu2.settcolor(WHITE);
802         menu2 << "Remove existing employee" << ui::endl;
803         menu2.settcolor(ui::tcolor);
804         menu2 << "Enter employee's id: ";
805         menu2.settcolor_input(YELLOW);
806         menu2 >> id;
807         menu2 << ui::endl;
808         menu2.setexit_button("Submit");
809         menu2.setback_func(back_func::set_backbit);
810         menu2.loop();
811         menu2.hide();
812     }
813     if(back_func::backbit)
814     {
815         back_func::backbit = 0;
816         return;
817     }
818     notice:
819     {
820         const int notice.height = 14;
821         box notice(menu2.corner.top_left, menu2.width, notice.height);

```

```

821     notice.settcolor(GREEN);
822     notice << ui::centeralign << "Employee Management" << ui::endl << ui::
        endl;
823     notice.settcolor(WHITE);
824     notice << "Hit the button below to display the details of the employee
        you want to remove: " << ui::endl;
825     notice.settcolor(ui::tcolor);
826     notice << ui::endl;
827     notice.setexit_button("View employee...");
828     notice.setback_func(back_func::set_backbit);
829     notice.loop();
830     notice.hide();
831 }
832 if(back_func::backbit)
833 {
834     back_func::backbit = 0;
835     goto menu2;
836 }
837 if( !view_emp(id) )
838 {
839     return;
840 }
841 notice2:
842 {
843     const int notice2_height = 14;
844     box notice2( menu2_corner_top_left, menu2_width, notice2_height );
845     notice2.settcolor(GREEN);
846     notice2 << ui::centeralign << "Employee Management" << ui::endl << ui::
        endl;
847     notice2.settcolor(WHITE);
848     notice2 << "Are you sure you want to remove this employee?(y/n): " << ui
        ::endl;
849     notice2.settcolor_input(YELLOW);
850     notice2 >> ch;
851     notice2.settcolor(ui::tcolor);
852     notice2 << ui::endl;
853     notice2.setexit_button("Submit");
854     notice2.setback_func(back_func::set_backbit);
855     notice2.loop();
856     notice2.hide();
857 }
858 if(back_func::backbit)
859 {
860     back_func::backbit = 0;
861     goto notice;
862 }
863 if(ch == 'n' || ch == 'N')
864 {
865     return;
866 }
867 const int notice3_height = 14;
868 box notice3( menu2_corner_top_left, menu2_width, notice3_height );
869 notice3.settcolor(GREEN);
870 notice3 << ui::centeralign << "Employee Management" << ui::endl << ui::endl;
871 notice3.settcolor(RED);
872 str path;
873 switch(id_to_emp::convert(id))
874 {
875     case INVALID:

```

```

876         interface::log_this("emp_mgmt::remove_emp() : No file with zero id
            exists\nFunction aborted");
877         notice3 << "Invalid ID supplied!! Check log" << ui::endl;
878         notice3.setexit_button("Back");
879         notice3.loop();
880         notice3.hide();
881         return;
882     case OTHERS:
883         sprintf(path, "employee/%lu", id);
884         break;
885     case DOCTOR:
886         mkdir("employee/doctor");
887         sprintf(path, "employee/doctor/%lu", id);
888         break;
889     case NURSE:
890         mkdir("employee/nurse");
891         sprintf(path, "employee/nurse/%lu", id);
892         break;
893     case RECEPTIONIST:
894         mkdir("employee/receptionist");
895         sprintf(path, "employee/receptionist/%lu", id);
896         break;
897     }
898     int remove_status;
899     str file;
900     strcpy(file, path);
901     strcat(file, "/base.dat");
902     if( remove(file) == -1)
903     {
904         str log_str;
905         sprintf(log_str, "emp_mgmt::remove_emp() : Failed to delete base.dat file
            of id %lu\nFunction aborted", id);
906         interface::log_this(log_str);
907         notice3 << "Failed to delete file of employee!!" << ui::endl;
908         notice3.setexit_button("Back");
909         notice3.loop();
910         notice3.hide();
911         return;
912     }
913     if( rmdir(path) == -1)
914     {
915         str log_str;
916         sprintf(log_str, "emp_mgmt::remove_emp() : Failed to delete folder of id
            %lu", id);
917         interface::log_this(log_str);
918     }
919     notice3.settcolor(GREEN);
920     notice3 << "Employee deletion successful!!" << ui::endl;
921     notice3.setexit_button("Back");
922     notice3.loop();
923     notice3.hide();
924 }
925
926 void emp_mgmt::edit_emp()
927 {
928     void * temp = malloc( sizeof(doctor) ); //as doctor has the greatest size
        among employee, doctor, nurse and receptionist classes
929     if(temp == NULL)
930     {

```

```

931     interface::log_this("emp_mgmt::edit_emp() : Not enough memory to allocate
          buffer void * temp = malloc( sizeof(doctor) )");
932     interface::error("Out of memory!! Check log");
933     getch();
934     return;
935 }
936 str name, dob_str, adr_hno, adr_street, adr_city, adr_dist, adr_state,
          shift_start_str, shift_end_str, uid, pwd, default_dob_str,
          default_shift_str;
937 unsigned sex_choice;
938 Date dob;
939 address adr;
940 phone phn_no;
941 unsigned long salary, id;
942 Time shift_start, shift_end;
943 const coord menu2_corner_top_left(ui::scr_width * 0.2, 5);
944 const int menu2_width = ui::scr_width * 0.6;
945 menu2:
946 {
947     const int menu2_height = 10;
948     box menu2(menu2_corner_top_left, menu2_width, menu2_height);
949     menu2.settcolor(GREEN);
950     menu2 << ui::centeralign << "Employee Management" << ui::endl << ui::endl
          ;
951     menu2.settcolor(WHITE);
952     menu2 << "Edit employee data" << ui::endl;
953     menu2.settcolor(ui::tcolor);
954     menu2 << "Step 1: Enter employee's id: ";
955     menu2.settcolor_input(YELLOW);
956     menu2 >> id;
957     menu2 << ui::endl;
958     menu2.setexit_button("Submit");
959     menu2.setback_func(back_func::set_backbit);
960     menu2.loop();
961     menu2.hide();
962 }
963 if(back_func::backbit)
964 {
965     back_func::backbit = 0;
966     free(temp);
967     return;
968 }
969 if(!hospital::get_employee_by_id(id, temp))
970 {
971     interface::error("ID not found or error while reading from file!");
972     getch();
973     free(temp);
974     return;
975 }
976 notice:
977 {
978     const int notice_height = 14;
979     box notice(menu2_corner_top_left, menu2_width, notice_height);
980     notice.settcolor(GREEN);
981     notice << ui::centeralign << "Employee Management" << ui::endl << ui::
          endl;
982     notice.settcolor(WHITE);
983     notice << "Details of the employee will now be shown with the existing
          data filled. "

```

```

984         << "Change the data fields that you require to change, and leave
           the other data fields as they are. "
985         << "When you are finished, press Submit to submit the new details.
           " << ui::endl;
986     notice.settcolor(ui::tcolor);
987     notice << ui::endl;
988     notice.setexit_button("View employee...");
989     notice.setback_func(back_func::set_backbit);
990     notice.loop();
991     notice.hide();
992 }
993 if(back_func::backbit)
994 {
995     back_func::backbit = 0;
996     goto menu2;
997 }
998 employee *e = (employee *) temp;
999 menu3:
1000 {
1001     const int menu3_height = 18;
1002     box menu3( menu2_corner_top_left, menu2_width, menu3_height );
1003     menu3.settcolor(GREEN);
1004     menu3 << ui::centeralign << "Employee Management" << ui::endl << ui::endl
           ;
1005     menu3.settcolor(WHITE);
1006     menu3 << "Edit employee data" << ui::endl;
1007     menu3.settcolor(ui::tcolor);
1008     menu3 << "Step 2: Edit employee details" << ui::endl << ui::endl;
1009
1010     menu3.settcolor_input(YELLOW);
1011     menu3 << "Name: ";
1012     menu3.setdefault( e->get_name() );
1013     menu3 >> name;
1014     menu3 << "Sex: 1. Male | 2. Female | 3. Transsexual" << ui::endl
           << "—— Enter your choice: ";
1015     validate_menu::set_menu_limits(1, 3);
1016     menu3.setdefault( e->get_sex() + 1 );
1017     menu3 >> validate_menu::input >> (int)sex.choice;
1018     menu3 << "Date of Birth(DD/MM/YYYY): ";
1019     sprintf(default_dob_str, "%u/%u/%u", e->get_dob().day, e->get_dob().month
           , e->get_dob().year);
1020     menu3.setdefault( default_dob_str );
1021     menu3 >> hospital::date_validity >> dob_str;
1022     menu3 << "Address: " << ui::endl;
1023     menu3 << (char)26 << "House no.: ";
1024     menu3.setdefault( e->get_address().house.no );
1025     menu3 >> adr_hno;
1026     menu3 << (char)26 << "Street: ";
1027     menu3.setdefault( e->get_address().street );
1028     menu3 >> adr_street;
1029     menu3 << (char)26 << "City: ";
1030     menu3.setdefault( e->get_address().city );
1031     menu3 >> adr_city;
1032     menu3 << (char)26 << "District: ";
1033     menu3.setdefault( e->get_address().district );
1034     menu3 >> adr_dist;
1035     menu3 << (char)26 << "State: ";
1036     menu3.setdefault( e->get_address().state );
1037     menu3 >> adr_state;
1038

```

```

1039     menu3 << "Phone no.: ";
1040     menu3.setdefault( e->get_phone() );
1041     menu3 >> phn.no;
1042     menu3 << "Salary: ";
1043     menu3.setdefault( e->get_salary() );
1044     menu3 >> salary;
1045     menu3 << "Shift timings: Starts - (HH:MM:SS)";
1046     sprintf(default_shift_str, "%u:%u:%u", e->get_shift(START).hour, e->
        get_shift(START).minute, e->get_shift(START).second );
1047     menu3.setdefault( default_shift_str );
1048     menu3 >> hospital::time_validity >> shift_start_str;
1049     menu3 << "_____: Ends - (HH:MM:SS)";
1050     sprintf(default_shift_str, "%u:%u:%u", e->get_shift(END).hour, e->
        get_shift(END).minute, e->get_shift(END).second );
1051     menu3.setdefault( default_shift_str );
1052     menu3 >> hospital::time_validity >> shift_end_str;
1053     menu3.setexit_button("Submit");
1054     menu3.setback_func(back_func::set_backbit);
1055     menu3.loop();
1056     menu3.hide();
1057 }
1058 if(back_func::backbit)
1059 {
1060     back_func::backbit = 0;
1061     goto notice;
1062 }
1063 —sex.choice;
1064 dob = hospital::str_to_date(dob_str);
1065 adr = address(adr_hno, adr_street, adr_city, adr_dist, adr_state);
1066 shift_start = hospital::str_to_time(shift_start_str);
1067 shift_end = hospital::str_to_time(shift_end_str);
1068 e->set_name(name);
1069 e->set_sex(sex.choice);
1070 e->set_dob(dob);
1071 e->set_address(adr);
1072 e->set_phone(phn.no);
1073 e->set_salary(salary);
1074 e->set_shift(START, shift_start);
1075 e->set_shift(END, shift_end);
1076 if(id_to_emp::convert(id) == DOCTOR)
1077 {
1078     coord c(1, 4);
1079     doctor *d = (doctor *)temp;
1080     box menu4(c, (ui::scr_width / 2), ui::scr_height - 5);
1081     box inp_box(( c + coord((ui::scr_width / 2) - 1, 0)), (ui::scr_width / 2)
        + 1, ui::scr_height - 5);
1082     menu4.f << ( ui::top | ui::left ) << (char)204
1083         << ( ui::bottom | ui::left ) << (char)204
1084         << ( ui::top | ui::right ) << (char)203
1085         << ( ui::bottom | ui::right ) << (char)202;
1086     menu4.f.display();
1087     inp_box.f << ( ui::top | ui::left ) << (char)203
1088         << ( ui::bottom | ui::left ) << (char)202
1089         << ( ui::top | ui::right ) << (char)185
1090         << ( ui::bottom | ui::right ) << (char)185;
1091     inp_box.f.display();
1092     menu4 << ui::centeralign << "Employee Management" << ui::endl << ui::endl
        ;
1093     menu4.settcolor(WHITE);

```

```

1094     menu4 << "Edit employee data" << ui::endl;
1095     menu4.settcolor(ui::tcolor);
1096     menu4 << "Step 3: Edit doctor details" << ui::endl << ui::endl;
1097     int speciality[2];
1098     menu4 << "Specialization of doctor (max 2)" << ui::endl
1099         << "Choose from the following list: " << ui::endl;
1100     for(int i = 0; i <= GEN; ++i)
1101     {
1102         if(i <= 8)
1103         {
1104             menu4 << i << ". " << (body_parts)i << ui::endl;
1105         }
1106         else
1107         {
1108             inp_box << i << ". " << (body_parts)i << ui::endl;
1109         }
1110     }
1111     inp_box.settcolor_input(YELLOW);
1112     inp_box << "Enter the number corresponding to the required entry in the 2
        fields below" << ui::endl;
1113     validate_menu::set_menu_limits(BRAIN, GEN);
1114     inp_box << (char)26;    inp_box.setdefault(d->get_speciality()[0]);
1115         inp_box >> validate_menu::input >> speciality[0];
1116     inp_box << (char)26;    inp_box.setdefault(d->get_speciality()[1]);
1117         inp_box >> validate_menu::input >> speciality[1];
1118     inp_box << ui::endl;
1119     inp_box.setexit_button("Submit");
1120     inp_box.setback_func(back_func::set_backbit);
1121     inp_box.loop();
1122     menu4.hide();
1123     inp_box.hide();
1124     window.f.display();
1125     d->set_speciality(speciality);
1126 }
1127 if(back_func::backbit)
1128 {
1129     back_func::backbit = 0;
1130     goto menu3;
1131 }
1132 const int notice2.height = 12;
1133 box notice2(menu2.corner_top_left, menu2.width, notice2.height);
1134 notice2.settcolor(GREEN);
1135 notice2 << ui::centeralign << "Employee Management" << ui::endl << ui::endl;
1136 if(!hospital::write_employee(temp))
1137 {
1138     notice2.settcolor(RED);
1139     notice2 << "Employee edit unsuccessful!!";
1140     notice2.setexit_button("Exit");
1141     notice2.loop();
1142     notice2.hide();
1143     free(temp);
1144     return;
1145 }
1146 notice2 << "Employee edited successfully!!" << ui::endl;
1147 notice2.settcolor(WHITE);
1148 notice2 << "Hit the button below to display the details you entered: " << ui
        ::endl;
1149 notice2.settcolor(ui::tcolor);
1150 notice2 << ui::endl;

```



```

1149     notice2.setexit_button("View employee...");
1150     notice2.loop();
1151     notice2.hide();
1152     view_emp(id);
1153     free(temp);
1154 }
1155
1156 void emp_mgmt::pay_emp()
1157 {
1158     unsigned long id;
1159     char ch;
1160     const coord menu2_corner_top_left = coord(ui::scr_width * 0.2, 5);
1161     const int menu2_width = ui::scr_width * 0.6;
1162     const int menu2_height = 10;
1163     menu2:
1164     {
1165         box menu2(menu2_corner_top_left, menu2_width, menu2_height);
1166         menu2.settcolor(GREEN);
1167         menu2 << ui::centralalign << "Employee Management" << ui::endl << ui::endl
1168         ;
1169         menu2.settcolor(WHITE);
1170         menu2 << "Pay salary to individual employee" << ui::endl;
1171         menu2.settcolor(ui::tcolor);
1172         menu2 << "Enter employee's id: ";
1173         menu2.settcolor_input(YELLOW);
1174         menu2 >> id;
1175         menu2 << ui::endl;
1176         menu2.setexit_button("Submit");
1177         menu2.setback_func(back_func::set_backbit);
1178         menu2.loop();
1179         menu2.hide();
1180     }
1181     if(back_func::backbit)
1182     {
1183         back_func::backbit = 0;
1184         return;
1185     }
1186     notice:
1187     {
1188         const int notice_height = 14;
1189         box notice(menu2_corner_top_left, menu2_width, notice_height);
1190         notice.settcolor(GREEN);
1191         notice << ui::centralalign << "Employee Management" << ui::endl << ui::
1192         endl;
1193         notice.settcolor(WHITE);
1194         notice << "Hit the button below to display the details of the employee
1195         you want to pay salary to: " << ui::endl;
1196         notice.settcolor(ui::tcolor);
1197         notice << ui::endl;
1198         notice.setexit_button("View employee...");
1199         notice.setback_func(back_func::set_backbit);
1200         notice.loop();
1201         notice.hide();
1202     }
1203     if(back_func::backbit)
1204     {
1205         back_func::backbit = 0;
1206         goto menu2;
1207     }

```

```

1205     if( !view_emp(id) )
1206     {
1207         return;
1208     }
1209     {
1210         const int notice2_height = 14;
1211         box notice2( menu2_corner_top_left, menu2_width, notice2_height );
1212         notice2.settcolor(GREEN);
1213         notice2 << ui::centralalign << "Employee Management" << ui::endl << ui::
            endl;
1214         notice2.settcolor(WHITE);
1215         notice2 << "Are you sure you want to pay salary to this employee?(y/n): "
            << ui::endl;
1216         notice2.settcolor_input(YELLOW);
1217         notice2 >> ch;
1218         notice2.settcolor(ui::tcolor);
1219         notice2 << ui::endl;
1220         notice2.setexit_button("Submit");
1221         notice2.setback_func(back_func::set_backbit);
1222         notice2.loop();
1223         notice2.hide();
1224     }
1225     if(back_func::backbit)
1226     {
1227         back_func::backbit = 0;
1228         goto notice;
1229     }
1230     if(ch == 'n' || ch == 'N')
1231     {
1232         return;
1233     }
1234     const int notice3_height = 14;
1235     box notice3( menu2_corner_top_left, menu2_width, notice3_height );
1236     notice3.settcolor(GREEN);
1237     notice3 << ui::centralalign << "Employee Management" << ui::endl << ui::endl;
1238     notice3.settcolor(RED);
1239     if( !hospital::pay_salary(id, system::get_date(), system::get_time()) )
1240     {
1241         notice3 << "Failed to pay salary to the employee! Check log";
1242         notice3.setexit_button("Back");
1243         notice3.loop();
1244         notice3.hide();
1245         return;
1246     }
1247     notice3.settcolor(GREEN);
1248     notice3 << "Pay salary successful!!" << ui::endl;
1249     notice3.setexit_button("Back");
1250     notice3.loop();
1251     notice3.hide();
1252 }
1253
1254 void emp_mgmt::pay_all()
1255 {
1256     char ch;
1257     const int menu2_height = 11;
1258     box menu2(coord(ui::scr_width * 0.2, 5), ui::scr_width * 0.6, menu2_height);
1259     menu2.settcolor(GREEN);
1260     menu2 << ui::centralalign << "Employee Management" << ui::endl << ui::endl;
1261     menu2.settcolor(WHITE);

```

```

1262     menu2 << "Pay salary to all employees" << ui::endl;
1263     menu2.settcolor(ui::tcolor);
1264     menu2 << "Are you sure you want to pay salary to all employees?(y/n): ";
1265     menu2.settcolor.input(YELLOW);
1266     menu2 >> ch;
1267     menu2 << ui::endl;
1268     menu2.setexit.button("Submit");
1269     menu2.loop();
1270     menu2.hide();
1271     if(ch == 'n' || ch == 'N')
1272     {
1273         return;
1274     }
1275     const int notice.height = 10;
1276     box notice( menu2.getcorner_top_left(), menu2.getwidth(), notice.height );
1277     notice.hide();
1278     box notice2( notice.getcorner_top_left(), notice.getwidth(), notice.getheight
1279     ( ) );
1280     notice2.settcolor(GREEN);
1281     notice2 << ui::centeralign << "Employee Management" << ui::endl << ui::endl;
1282     notice2.hide(); notice.display();
1283     notice.settcolor(GREEN);
1284     notice << ui::centeralign << "Employee Management" << ui::endl << ui::endl;
1285     notice.settcolor(ui::tcolor);
1286     notice << "Pay all salaries in progress..." << ui::endl;
1287     if( !hospital::pay_all_salaries() )
1288     {
1289         notice.hide();
1290         notice2.settcolor(RED);
1291         notice2 << "Failed to pay salary to all employees! Check log";
1292         notice2.setexit.button("Back");
1293         notice2.loop();
1294         notice2.hide();
1295         return;
1296     }
1297     notice.hide(); notice2.display();
1298     notice2 << "Pay all salaries successful!!" << ui::endl;
1299     notice2.setexit.button("Back");
1300     notice2.loop();
1301     notice2.hide();
1302 }

```

2. code/HOSP.CPP

```

1
2 int hospital::get_employee_by_id(unsigned long ID, void * target)
3 {
4     if(target == NULL)
5     {
6         interface::log_this("hospital::get_employee_by_id() : NULL pointer
6         supplied to function\nFunction aborted");
7         return 0;
8     }
9     str temp;
10    int size_of_target;
11    switch(id_to_emp::convert(ID))
12    {
13        case INVALID:

```

```

14         interface::log_this("hospital::get_employee_by_id() : Invalid id
           supplied to function\nFunction aborted");
15         return 0;
16     case OTHERS:
17         sprintf(temp, "employee/%lu/base.dat", ID);
18         size_of_target = sizeof(employee);
19         break;
20     case DOCTOR:
21         sprintf(temp, "employee/doctor/%lu/base.dat", ID);
22         size_of_target = sizeof(doctor);
23         break;
24     case NURSE:
25         sprintf(temp, "employee/nurse/%lu/base.dat", ID);
26         size_of_target = sizeof(nurse);
27         break;
28     case RECEPTIONIST:
29         sprintf(temp, "employee/receptionist/%lu/base.dat", ID);
30         size_of_target = sizeof(receptionist);
31         break;
32     }
33     int i = hospital::read_from( ID, (char*) target, size_of_target, temp );
34     if(!i)
35     {
36         target = NULL;
37         return 0;
38     }
39     return 1;
40 }
41
42 int hospital::write_employee(void * a)
43 {
44     if(a == NULL)
45     {
46         interface::log_this("hospital::write_employee() : NULL pointer supplied
           to function\nFunction aborted");
47         return 0;
48     }
49     mkdir("employee");
50     str temp;
51     int size_of_target;
52     employee *x = (employee *) a;
53     const unsigned long ID = x->get_id();
54     switch(id_to_emp::convert(ID))
55     {
56     case INVALID:
57         interface::log_this("hospital::write_employee() : Object with ID zero
           cannot be written to file\nFunction aborted");
58         return 0;
59     case OTHERS:
60         sprintf(temp, "employee/%lu", ID);
61         size_of_target = sizeof(employee);
62         break;
63     case DOCTOR:
64         mkdir("employee/doctor");
65         sprintf(temp, "employee/doctor/%lu", ID);
66         size_of_target = sizeof(doctor);
67         break;
68     case NURSE:
69         mkdir("employee/nurse");

```

```

70         sprintf(temp, "employee/nurse/%lu", ID);
71         size_of_target = sizeof(nurse);
72         break;
73     case RECEPTIONIST:
74         mkdir("employee/receptionist");
75         sprintf(temp, "employee/receptionist/%lu", ID);
76         size_of_target = sizeof(receptionist);
77         break;
78     }
79     mkdir(temp);
80     strcat(temp, "/base.dat");
81     ofstream fout ( temp , ios::out | ios::binary);
82     if(!fout)
83     {
84         interface::log_this("hospital::write_employee() : Employee data file
85         could not be created or accessed\nFunction aborted");
86         return 0;
87     }
88     fout.write( (char *) a , size_of_target );
89     if(fout.fail())
90     {
91         interface::log_this("hospital::write_employee() : Error while writing to
92         file (fout.fail())\nFunction aborted");
93         return 0;
94     }
95     return 1;
96 }
97
98 int hospital::pay_salary(unsigned long id, Date d1, Time t1)
99 {
100     void * e = malloc( sizeof(doctor) );
101     if(e == NULL)
102     {
103         interface::log_this("hospital::pay_salary() : Not enough memory to
104         allocate buffer void * temp = malloc( sizeof(doctor) );");
105         interface::error("Out of memory!! Check log");
106         getch();
107         return 0;
108     }
109     str temp;
110     switch(id_to_emp::convert(id))
111     {
112     case INVALID:
113         interface::log_this("hospital::pay_salary() : Invalid id supplied to
114         function\nFunction aborted");
115         return 0;
116     case OTHERS:
117         sprintf(temp, "employee/%lu/trans.dat", id);
118         break;
119     case DOCTOR:
120         sprintf(temp, "employee/doctor/%lu/trans.dat", id);
121         break;
122     case NURSE:
123         sprintf(temp, "employee/nurse/%lu/trans.dat", id);
124         break;
125     case RECEPTIONIST:
126         sprintf(temp, "employee/receptionist/%lu/trans.dat", id);
127         break;
128     }

```

```

125     if(!hospital::get_employee_by_id(id, e))
126     {
127         interface::log_this("hospital::pay_salary() : Employee not found or error
128             while reading file\nFunction aborted");
129         free(e);
130         return 0;
131     }
132     unsigned long inp1;
133     char inp2[100] = "Salary paid to ";
134     employee * emp = (employee *)e;
135     inp1 = emp->get_salary();
136     strcat(inp2, emp->get_name());
137     transaction t = hospital::deduct_money(inp1, inp2, dl, t1);
138     free(e);
139     ofstream fout ( temp ,ios::binary | ios::app );
140     if(!fout)
141     {
142         interface::log_this("hospital::pay_salary() : Employee data file could
143             not be created or accessed\nFunction aborted");
144         return 0;
145     }
146     fout.write((char *) &t, sizeof(transaction));
147     if(fout.fail())
148     {
149         interface::log_this("hospital::pay_salary() : Error while writing to file
150             (fout.fail())\nFunction aborted");
151         return 0;
152     }
153     return 1;
154 }
155
156 int hospital::pay_all_salaries()
157 {
158     Date dl = system::get_date();
159     Time t1 = system::get_time();
160     unsigned long max_id;
161     ifstream fin;
162     fin.open("employee/max_id.dat", ios::binary);
163     if(!fin)
164     {
165         interface::log_this("hospital::pay_all_salaries() : No employees found or
166             cannot access file max_id.dat\nFunction aborted");
167         return 0;
168     }
169     else
170     {
171         fin.read((char *) &max_id, sizeof(unsigned long));
172         if(fin.fail())
173         {
174             interface::log_this("hospital::pay_all_salaries() : Error while
175                 reading file max_id.dat(fin.fail())\nFunction aborted");
176             return 0;
177         }
178         if(!employee::get_generate_id_status())
179         {
180             //if generate_id.status is zero, then no id is generated after max_id
181             + 1
182             //Thus, the following loop should run max_id + 1 times
183             ++max_id;

```

```

178     }
179     for(unsigned long i = 1; i <= max_id; ++i)
180     {
181         int a = hospital::pay-salary(i, d1, t1);
182         if(!a)
183         {
184             str log_msg;
185             sprintf(log_msg, "hospital::pay-all-salaries() : Failed to pay
186                 salary of id %lu...\nSkipped", i);
187             interface::log_this(log_msg);
188         }
189     }
190     return 1;
191 }
192
193 int hospital::time-validity(const char * inp_time)
194 {
195     return time-validity( str_to_time(inp_time) );
196 }
197
198 int hospital::time-validity(Time t)
199 {
200     if( t.hour > 24 || t.minute > 59 || t.second > 59)
201     {
202         return 0;
203     }
204     return 1;
205 }
206
207 Time hospital::str_to_time(const char * inp_time)
208 {
209     ////////In this function invalid time(25:00:00) is returned if time is in
210     incorrect format//////////
211     char inp[3][3] = {"25", "0", "0"};
212     int inp_x = 0, inp_y = 0;
213     Time null(25, 0, 0);
214     if( strlen(inp_time) > 8 || strlen(inp_time) < 5 || inp_time[strlen(inp_time)
215         - 1] == ':' )
216     {
217         return null;
218     }
219     for(int i = 0; i < strlen(inp_time); ++i)
220     {
221         if(inp_time[i] == ':' && inp_y != 0)
222         {
223             inp[inp_x][inp_y] = '\0';
224             ++inp_x;
225             inp_y = 0;
226             continue;
227         }
228         else if( (inp_y == 0 && inp_time[i] == ':') || inp_y > 1
229             || (inp_time[i] < '0' || inp_time[i] > '9') )
230         {
231             return null;
232         }
233         inp[inp_x][inp_y] = inp_time[i];
234         ++inp_y;
235     }

```

```

234     char *endptr;
235     null.hour = (unsigned int) strtol(inp[0], &endptr, 10);
236     null.minute = (unsigned int) strtol(inp[1], &endptr, 10);
237     null.second = (unsigned int) strtol(inp[2], &endptr, 10);
238     return null;
239 }

```

3. code/iface.cpp

```

1  int interface::validate_menu::input(const char * ch)
2  {
3      char *endptr;
4      int a = (int) strtol(ch, &endptr, 10);
5      if(!validation::vint(ch) || a < lowest_choice || a > greatest_choice)
6      {
7          return 0;
8      }
9      else
10     {
11         return 1;
12     }
13 }
14
15 void interface::validate_menu::set_menu_limits(int a, int b)
16 {
17     lowest_choice = a;
18     greatest_choice = b;
19 }
20
21 int interface::validate_menu::lowest_choice = 0;
22 int interface::validate_menu::greatest_choice = 0;
23
24 int interface::back_func::set_backbit()
25 {
26     backbit = 1;
27     return 1;
28 }
29
30 int interface::back_func::backbit = 0;
31
32 int interface::log_this(char * message)
33 {
34     Date dnow = system::get_date();
35     Time tnow = system::get_time();
36     char text[300];
37     sprintf(text, "$ [%u-%u-%u %u:%u:%u +0530]: ", dnow.day, dnow.month, dnow.
        year, tnow.hour, tnow.minute, tnow.second);
38     strcat(text, message);
39     ofstream fout;
40     fout.open("log.txt", ios::out | ios::app);
41     if(!fout)
42         return 0;
43     fout << text << endl;
44     if(fout.fail())
45         return 0;
46     fout.close();
47     return 1;
48 }

```



```

49
50 interface::interface() {}

```

4. code/EMP.CPP

```

1  #include "hosp.hpp"
2  #include "iface.hpp"
3  #include "emp.hpp"
4  #include "base.hpp"
5  #include <fstream.h>
6
7  //////////////////////////////////////
8  /// Function definitions for class employee
9
10 int employee::generate_id()
11 {
12     mkdir("employee");
13     unsigned long max_id;
14     ifstream fin;
15     fin.open("employee/max_id.dat", ios::binary);
16     if(!fin)
17     {
18         interface::log_this("employee::generate_id() : File max_id.dat not found
19                             or error while loading file\nmax_id will be set to zero");
20         max_id = 0;
21     }
22     else
23     {
24         fin.read((char *) &max_id, sizeof(unsigned long));
25         if(fin.fail())
26         {
27             interface::log_this("employee::generate_id() : Error while reading
28                                 from file max_id.dat (fin.fail())\nFunction aborted");
29             id = 0;
30             return 0;
31         }
32     }
33     fin.close();
34     ++max_id;
35     id = max_id;
36     ofstream fout;
37     fout.open("employee/max_id.dat", ios::binary);
38     fout.write((char *) &max_id, sizeof(unsigned long));
39     if(fout.fail())
40     {
41         interface::log_this("employee::generate_id() : Error while writing to
42                             file max_id.dat (fout.fail())\nFunction aborted");
43         return 0;
44     }
45     else
46         return 1;
47 }
48
49 int employee::generate_id_status = 1;
50
51 employee::employee(str inp1, int inp2, Date inp3, address inp4, phone inp5,
52                   unsigned long inp6, Time inp7, Time inp8, str inp9, str inp10) : person(inp1,
53                   inp2, inp3, inp4, inp5), account(inp9, inp10)

```

```

49 {
50     if(!generate_id.status)
51     {
52         interface::error("ID cannot be generated for this employee. Check log");
53         interface::log.this("employee::employee() : ID generation using
            generate_id() unsuccessful as generate_id.status is set to zero.\nThis
            is because some error was encountered during the last ID generation")
            ;
54     }
55     else
56     {
57         employee::generate_id.status = generate_id();
58         id_to_emp il(id, OTHERS);
59         if(!il.status)
60         {
61             interface::error("ID not generated properly for this employee. Check
                log");
62             interface::log.this("employee::employee() : il.status was set to zero
                , i.e id_list.dat doesn't have a record of the employee's id");
63         }
64         salary = inp6;
65         shift_start = inp7;
66         shift_end = inp8;
67     }
68 }
69
70 employee::employee() : person()
71 {
72     id = 0;
73 }
74
75 int employee::get_age()
76 {
77     //////////Updating age to present age//////////
78     set_dob(dob); //This function is used here to invoke calc_age() in it
       only(because calc_age is directly not accessible)
79     void * temp = malloc( sizeof(doctor) );
80     if(temp != NULL && hospital::get_employee_by_id(id, temp)) //if
       employee's file exists on disk
81     {
82         hospital::write_employee( this ); //overwrite that file
83     }
84     free(temp);
85     return age;
86 }
87
88 unsigned long employee::get_salary(){
89     return salary;
90 }
91
92 void employee::set_salary(unsigned long inp)
93 {
94     salary = inp;
95 }
96
97 Time employee::get_shift(int inp){
98     switch(inp){
99         case START:
100         return shift_start;

```

```

101         case END:
102             return shift_end;
103         default:
104             return Time(0,0,0);
105     }
106 }
107
108 void employee::set_shift(int inp1, Time inp2)
109 {
110     switch (inp1)
111     {
112         case START:
113             shift_start = inp2;
114             return;
115         case END:
116             shift_end = inp2;
117             return;
118         default:
119             return;
120     }
121 }
122
123 unsigned long employee::get_id()
124 {
125     return id;
126 }
127
128 transaction * employee::get_last_5_transactions()
129 {
130     transaction * t = (transaction *)malloc(5 * sizeof(transaction));
131     if(t == NULL)
132     {
133         interface::log_this("employee::get_last_5_transactions() :Not enough
134             memory to allocate buffer void * temp = malloc( sizeof(doctor) )\
135             nFunction aborted");
136         return NULL;
137     }
138     for(int i = 0; i < 5; ++i)
139     {
140         t[i] = transaction();
141     }
142     str temp;
143     switch( id_to_emp::convert(id) )
144     {
145         case INVALID:
146         {
147             char log_msg[300];
148             sprintf(log_msg, "employee::get_last_5_transactions() : The object
149                 has invalid id (%lu)\nFunction aborted", id);
150             interface::log_this(log_msg);
151             free(t);
152             return NULL;
153         }
154         case DOCTOR:
155         {
156             sprintf(temp, "employee/doctor/%lu/trans.dat", id);
157             break;
158         }
159         case NURSE:

```

```

157     {
158         sprintf(temp, "employee/nurse/%lu/trans.dat", id);
159         break;
160     }
161     case RECEPTIONIST:
162     {
163         sprintf(temp, "employee/receptionist/%lu/trans.dat", id);
164         break;
165     }
166     case OTHERS:
167     {
168         sprintf(temp, "employee/%lu/trans.dat", id);
169         break;
170     }
171 }
172 ifstream fin ( temp ,ios::binary | ios::in | ios::nocreate | ios::ate);
173 if(!fin)
174 {
175     char log_msg[300];
176     sprintf(log_msg, "employee::get_last_5_transactions() : Failed to open
177         file trans.dat for id %lu\nFunction aborted", id);
178     interface::log_this(log_msg);
179     free(t);
180     return NULL;
181 }
182 int max_i, size_of_file = fin.tellg();
183 if( size_of_file >= ( 5 * sizeof(transaction) ) )
184 {
185     const int a = (-5) * sizeof(transaction);
186     fin.seekg(a, ios::end);
187     max_i = 5;
188 }
189 else
190 {
191     fin.seekg(0, ios::beg);
192     max_i = (int)( size_of_file / sizeof(transaction) );
193 }
194 for(i = 0; i < max_i && !fin.eof(); ++i)
195 {
196     fin.read((char *) (t+i), sizeof(transaction));
197     if(fin.fail())
198     {
199         char log_msg[300];
200         sprintf(log_msg, "employee::get_last_5_transactions() : Failed to
201             read file trans.dat for id %lu(loop failed at i = %i)\nFunction
202             aborted", id, i);
203         interface::log_this(log_msg);
204         free(t);
205         return NULL;
206     }
207 }
208 fin.close();
209 return t;
210 }
211
212 int employee::get_generate_id_status()
213 {
214     return generate_id_status;
215 }

```

```

213
214 //////////////////////////////////////////////////
215 /// Doctor, Nurse and Receptionist class member defs
216
217 doctor::doctor(str inp1, int inp2, Date inp3, address inp4, phone inp5, unsigned
    long inp6, Time inp7, Time inp8, int inp10, int inp11, str inp12, str inp13) :
    employee(inp1, inp2, inp3, inp4, inp5, inp6, inp7, inp8, inp12, inp13)
218 {
219     id_to_emp il(get_id(), DOCTOR);
220     if(!il.status)
221     {
222         interface::error("ID not generated properly for this employee. Check log"
            );
223         interface::log_this("doctor::doctor() : il.status was set to zero, i.e
            id_list.dat doesn't have a record of the employee's id");
224     }
225     speciality[0] = inp10;
226     speciality[1] = inp11;
227
228     for(int i = 0; i < 10; i++){
229         patients[i] = 0;
230     }
231 }
232
233 doctor::doctor() : employee()
234 {
235     speciality[0] = speciality[1] = GEN + 1;    //storing an invalid value in
        speciality
236     for(int i = 0; i < 10; ++i)
237     {
238         patients[i] = 0;
239     }
240 }
241
242 int * doctor::get_speciality()
243 {
244     return speciality;
245 }
246
247 long * doctor::get_patients()
248 {
249     return patients;
250 }
251
252 void doctor::set_speciality(int inp[2])
253 {
254     speciality[0] = inp[0];
255     speciality[1] = inp[1];
256 }
257
258 void doctor::set_patients(long inp[10])
259 {
260     for(int i = 0; i < 10; ++i)
261     {
262         patients[i] = inp[i];
263     }
264 }
265
266 nurse::nurse(str inp1, int inp2, Date inp3, address inp4, phone inp5, unsigned

```

```

    long inp6, Time inp7, Time inp8, str inp10, str inp11) : employee(inp1, inp2,
inp3, inp4, inp5, inp6, inp7, inp8, inp10, inp11)
267 {
268     id_to_emp i1(get_id(), NURSE);
269     if(!i1.status)
270     {
271         interface::error("ID not generated properly for this employee. Check log"
);
272         interface::log_this("nurse::nurse() : i1.status was set to zero, i.e
id_list.dat doesn't have a record of the employee's id");
273     }
274     for(int i = 0; i < 5; i++){
275         patients[i] = 0;
276     }
277 }
278
279 nurse::nurse() : employee()
280 {
281     for(int i = 0; i < 5; ++i)
282     {
283         patients[i] = 0;
284     }
285 }
286
287 long * nurse::get_patients()
288 {
289     return patients;
290 }
291
292 void nurse::set_patients(long inp[5])
293 {
294     for(int i = 0; i < 5; ++i)
295     {
296         patients[i] = inp[i];
297     }
298 }
299
300 receptionist::receptionist(str inp1, int inp2, Date inp3, address inp4, phone
inp5, unsigned long inp6, Time inp7, Time inp8, str inp10, str inp11) :
employee(inp1, inp2, inp3, inp4, inp5, inp6, inp7, inp8, inp10, inp11)
301 {
302     id_to_emp i1(get_id(), RECEPTIONIST);
303     if(!i1.status)
304     {
305         interface::error("ID not generated properly for this employee. Check log"
);
306         interface::log_this("receptionist::receptionist() : i1.status was set to
zero, i.e id_list.dat doesn't have a record of the employee's id");
307     }
308 }
309
310 receptionist::receptionist() : employee()
311 {}
312
313
314 //////////////////////////////////////
315 /// Function definitions for class id_to_emp
316
317 id_to_emp::id_to_emp(unsigned long inp1, int inp2)

```

```

318 {
319     status = 0;
320     id = inp1;
321     if(!id)
322     {
323         employee_type = INVALID;
324     }
325     else
326     {
327         employee_type = inp2;
328     }
329     mkdir("employee");
330     ofstream fout;
331     fout.open("employee/id_list.dat", ios::binary | ios::ate);
332     if(!fout)
333     {
334         interface::log_this("id_to_emp::id_to_emp() : File id_list.dat couldn't
                                be opened...\nFunction aborted");
335     }
336     else
337     {
338         fout.seekp(id * sizeof(id_to_emp), ios::beg);
339         fout.write((char *) this, sizeof(id_to_emp));
340         if(fout.fail())
341         {
342             interface::log_this("id_to_emp::id_to_emp() : Error while writing to
                                    file id_list.dat (fout.fail())\nFunction aborted");
343         }
344         else
345         {
346             status = 1;
347         }
348     }
349 }
350
351 id_to_emp::id_to_emp()
352 {
353     id = employee_type = status = 0;
354 }
355
356 int id_to_emp::convert(unsigned long ID)
357 {
358     id_to_emp a;
359     ifstream fin;
360     fin.open("employee/id_list.dat", ios::binary);
361     if(!fin)
362     {
363         interface::log_this("id_to_emp::convert() : File id_list.dat not found!!"
                                );
364         return INVALID;
365     }
366     fin.seekg( (ID * sizeof(id_to_emp)) );
367     fin.read((char *) &a, sizeof(id_to_emp));
368     if(fin.fail())
369     {
370         interface::log_this("id_to_emp::convert() : Error while reading from file
                                id_list.dat (fin.fail())");
371         return INVALID;
372     }

```

```
373     fin.close();
374     if(a.id != ID)
375     {
376         interface::log_this("id_to_emp::convert() : (For dev only)Error in the
            code... Recheck it!!");
377         return INVALID;
378     }
379     return a.employee_type;
380 }
```