11. A Munro is a mountain in Scotland that is over 3,000 feet high. A database-driven website is being created to share information about these mountains and to allow climbers to record which Munros they have climbed.

The details of each Munro will be stored, along with a difficulty level from 1 (easy) to 5 (difficult).

(a) The developers begin by investigating the hardware and software required for running this system.

State the type of feasibility being investigated. **1**

(b) The website will allow all users to search for details of a Munro and register for an account. In addition, registered users can add details of any climb they have completed, and if required, they can add a comment about the climb. Registered users can then view details of all climbs that have completed.

Draw a UML use case diagram for this website. **3**

[Turn over

11. (continued)

Information processed by the website is stored in a database in three related tables: Munro, Climber and Climb.

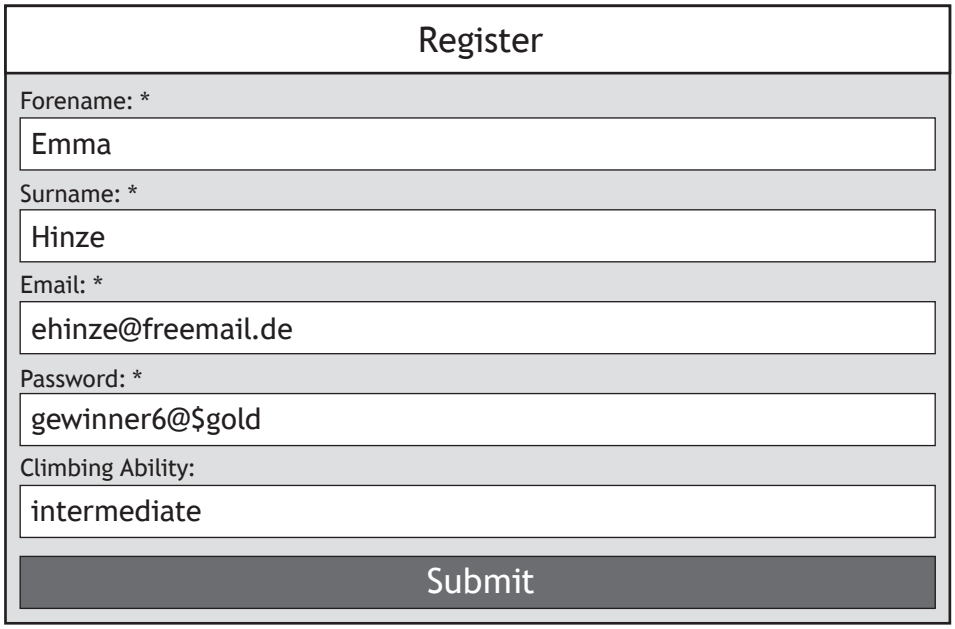
Munro
munroID
munroName
height
latitude
longitude
difficulty level

Climber
climberID
forename
surname
email
password
climbingAbility

Climb
climbID
climberID*
munroID*
date
timeTaken
notes

When a new user registers with the website, they complete a registration form.

(c) A wireframe for this form is shown below. When submitted, this data is sent to a page called `checkUser.php`.



MARKS

11. (c) (continued)

When this form data is submitted, the following design is used to check whether the submitted email address has already been registered.

```
...
22.  create query to select climbers with email address = submitted email
23.  execute SQL query
24.  set $matches to _____________________________________
25.  if $matches > 0 then
26.      _____________________________________
27.  else
28.      add new user details to Climber table
29.  end if
```

(i) Write the pseudocode needed to complete line 24 and line 26 of the design. **2**

(ii) The HTML form elements used on the registration form are shown below.

```
< input type = "text" name = "first" required >
< input type = "text" name = "last" required >
< input type = "text" name = "email" required >
< input type = "text" name = "pass" required >
< input type = "text" name = "level" >
```

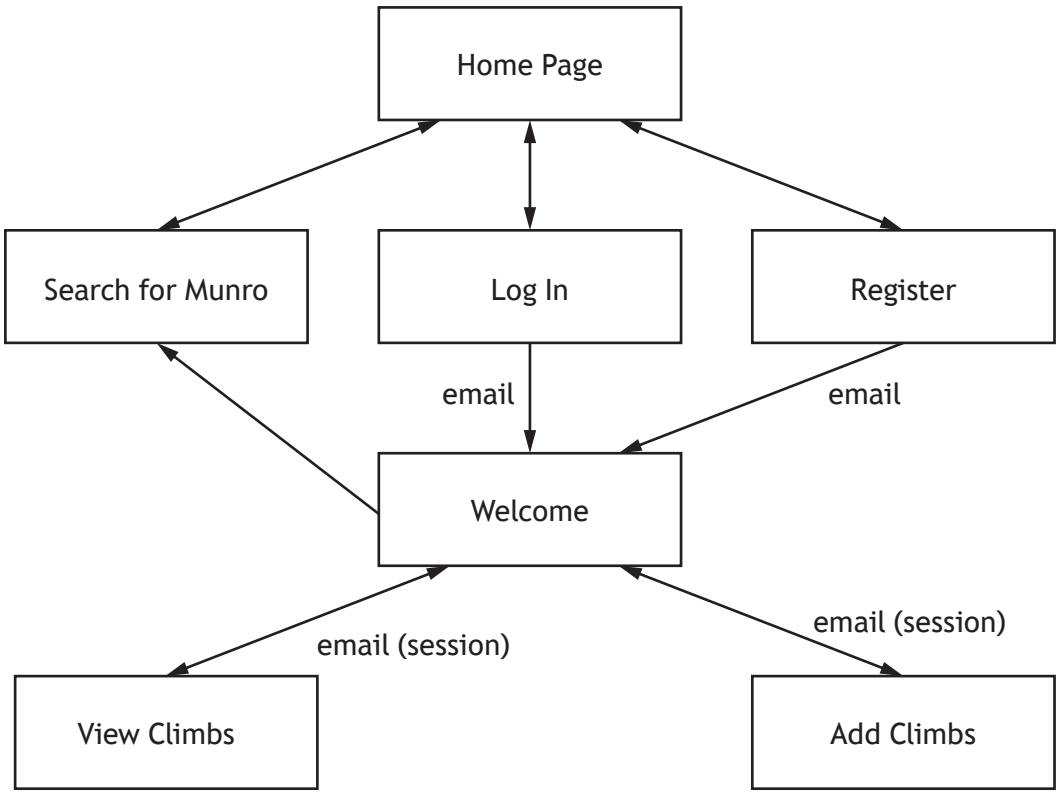
Write the PHP code that will be used on the `checkUser.php` page to assign the data submitted from the registration form to PHP variables. **2**

(iii) Write the SQL query to add details of the new user shown on the wireframe to the database. **2**

[Turn over

11. (continued)

(d) The navigational structure of the website is shown below.



When a registered user logs in using their email address and password, the 'Welcome' page is displayed.

This page contains the following code:

```
session_start();
$email = $_SESSION['email'];
```

The same code is also used on the 'View Climbs' and the 'Add Climb' pages.

(i) Explain why a session variable is necessary on these pages. **1**

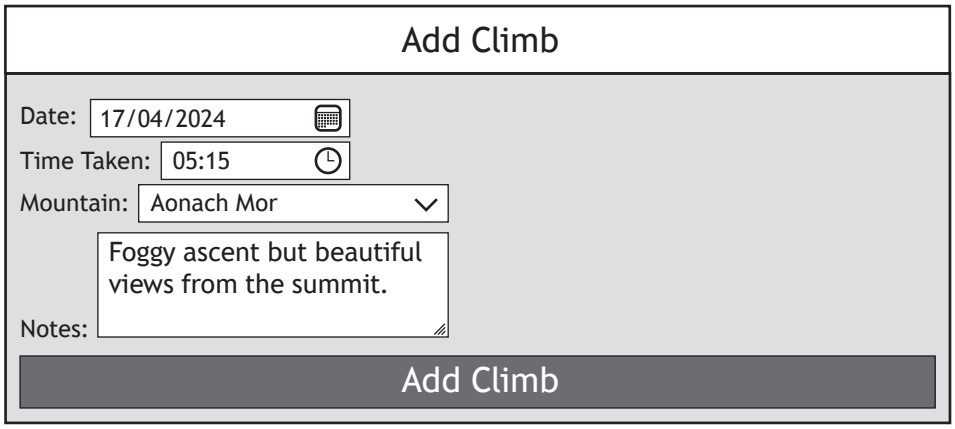
(ii) Describe the use made of this session variable on the 'View Climbs' page used to display details of all climbs completed by a logged in user. **1**

[Turn over for next question

DO NOT WRITE ON THIS PAGE

11. (continued)

(e) The 'Add Climb' page uses the form below to allow registered users to record details of any Munros they have climbed.



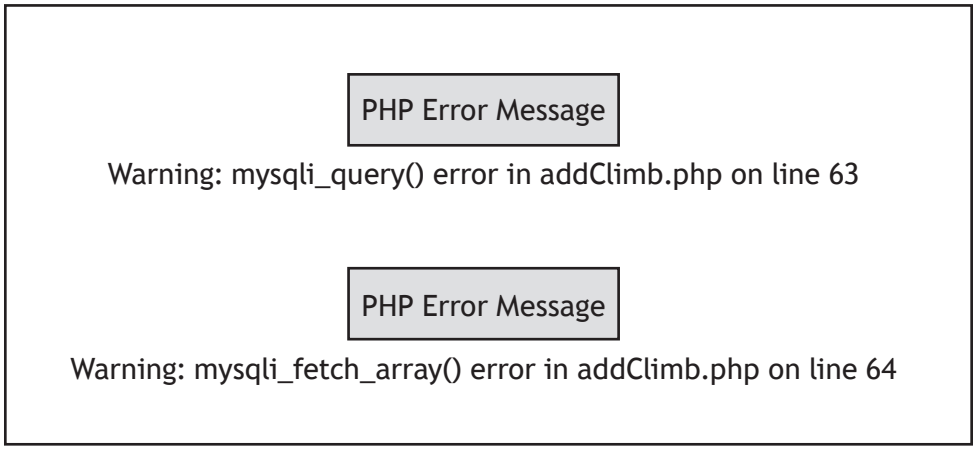
The first attempt to create the drop-down list for selection of the mountain resulted in the PHP and HTML code shown below.

```
...
Line 59   < select name="mountain" >
Line 60   < ?php
Line 61   $connection = mysqli_connect("scottishClimbs",
          "nevis", "lomond", "climbing");
Line 62   $sql = "SELECT munroName, munroID FROM Munro ORDER
          BY munroName ASC";
Line 63   $result = mysqli_query($sql);
Line 64   while($row = mysqli_fetch_array()) {
Line 65       echo "< option value = " .$row['munroID']." >
          ".$row['munroName']."< /option >";
Line 66   }
Line 67   mysqli_close($connection);
Line 69   ? >
Line 70   < /select >
...
```

(i) Identify the username for this database connection. **1**

11. (e) (continued)

(ii) When this code is executed, the following error messages are produced:



Explain these errors and describe how they could be resolved. **2**

(f) The 'View Climbs' page is used to display details of climbs completed by registered users of the website.

PHP code is to be added to this page.

The design of one process performed by the code is shown below.

```
1.  set $numClimbers to number of climbers in Climber table
2.  set $most = 0
3.  start loop from 1 to $numClimbers
4.      set $climberID = loop
5.      set $howMany = number of climbs completed by $climberID
6.      if $howMany > $most then
7.          set $most = $howMany
8.      end if
9.  end loop
10. create query to select full name of climber(s) with number of climbs
    completed = $most
11. execute query and assign results to $result
12. assign $result to array $target
13. display forename(s) and surname(s) stored in $target
```

(i) Describe the intended purpose of this design. **1**

(ii) Identify a potential problem at line 5 of the design. **1**