Module Code: COS1511

Assessment: Assignment 3

Student Number: 69234175

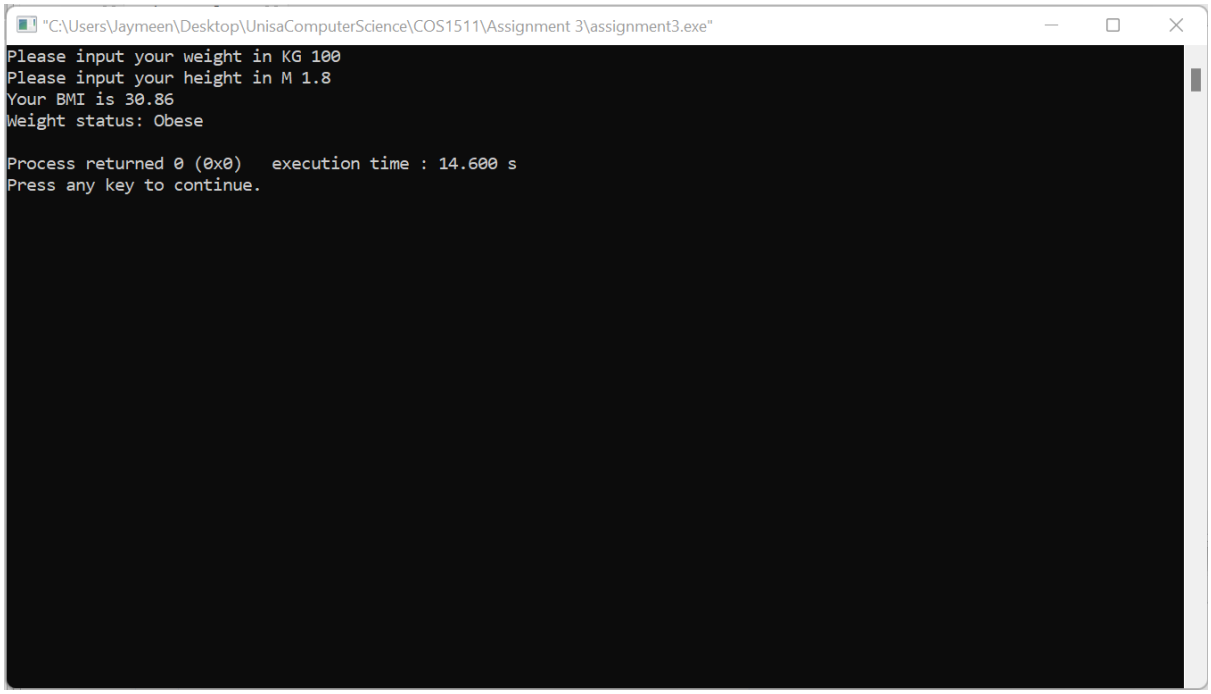
Name: Jaymeen Patel

Question one

```
#include <iostream>

using namespace std;

//Question 1.1
void getData(float &weight, float &height)
{
  cout << "Please input your weight in KG ";
  cin >> weight;
  cout << "Please input your height in M ";
  cin >> height;
}

//Question 1.2
float calcBMI(float weight, float height)
{
   float BMI;
   BMI = weight/(height*height);
   return BMI;
}

//Question 1.3
string displayFitnessResults (float BMI)
```

```
{
   string message;

   if (BMI<18.5)
      message = "Underweight";
   else if(BMI >= 18.5 && BMI <= 24.9)
      message = "Healthy";
   else if(BMI >= 25.0 && BMI <= 29.9)
      message = "Overweight";
   else if (BMI >= 30.0)
      message = "Obese";

   return message;
}


//Question 1.4
int main()
{
   float weight, height, BMI;
   string message;

      getData(weight,height);
      BMI = calcBMI(weight,height);
      message = displayFitnessResults(BMI);

      cout.setf(ios::fixed);
      cout.precision(2);
      cout << "Your BMI is " << BMI << endl;
      cout << "Weight status: " << message << endl;
```

```
    return 0;
}
```



Question two

```
#include <iostream>

using namespace std;

//Question 2a
void studentDetails(string &name, string &surname, string&schoolName)
{
    cout << "Please enter your first name: " << endl;
    getline(cin, name, '\n');
    cout << "Please enter your  surname: " << endl;
    getline(cin, surname, '\n');
    cout << "Please enter your  Schoolname: " << endl;
```

```
    getline(cin, schoolName, '\n');


}


//Question 2b
void getMarks(int &markEnglish,int &markMaths,int &markLO,int &markHistory,int
&markComputerL,int &markGeography)
{
    cout << "Please enter your mark for English: " << endl;
    cin >> markEnglish;


    while (markEnglish<0 || markEnglish>100)
        {cout << "Please enter a mark between 0-100" << endl;
        cin >> markEnglish;}


    cout << "Please enter your mark for Mathematics: " << endl;
    cin >> markMaths;


    while (markMaths<0 || markMaths>100)
        {cout << "Please enter a mark between 0-100" << endl;
        cin >> markMaths;}


    cout << "Please enter your mark for Life Orientation: " << endl;
    cin >> markLO;


    while (markLO<0 || markLO>100)
        {cout << "Please enter a mark between 0-100" << endl;
        cin >> markLO;}


    cout << "Please enter your mark for History: " << endl;
    cin >> markHistory;
```

```
    while (markHistory<0 || markHistory>100)
       {cout << "Please enter a mark between 0-100" << endl;
       cin >> markHistory;}

    cout << "Please enter your mark for Computer Literacy: " << endl;
    cin >> markComputerL;

    while (markComputerL<0 || markComputerL>100)
       {cout << "Please enter a mark between 0-100" << endl;
       cin >> markComputerL;}

    cout << "Please enter your mark for Geography: " << endl;
    cin >> markGeography;

    while (markGeography<0 || markGeography>100)
       {cout << "Please enter a mark between 0-100" << endl;
       cin >> markGeography;}

}

//Question 2c
void calcAverageYearMark(float markEnglish,float markMaths,float markLO,float markHistory,float
markComputerL,float markGeography)
{
    float average;
    float sum;
    string symbol, code;

    sum = (markEnglish + markMaths + markLO + markHistory + markComputerL + markGeography);
    average = sum / 6;

    cout.setf(ios::fixed);
```

```
   cout.precision(2);


   switch(int(average))
   {
      case 80 ... 100 :   symbol = "A";
                          code = "7";
                          cout << endl;
                          cout << "Average Year Mark: " << average << "%"  << " with Symbol " << symbol << "
and code " << code << endl;
                          break;


      case 70 ... 79 :    symbol = "B";
                           code = "6";
                           cout << endl;
                           cout << "Average Year Mark: " << average << "%"  << " with Symbol " << symbol << "
and code " << code << endl;
                          break;


      case 60 ... 69 :    symbol = "C";
                          code = "5";
                          cout << endl;
                         cout << "Average Year Mark: " << average << "%"  << " with Symbol " << symbol << "
and code " << code << endl;
                          break;


      case 50 ... 59 :    symbol = "D";
                          code = "4";
                          cout << endl;
                         cout << "Average Year Mark: " << average << "%"  << " with Symbol " << symbol << "
and code " << code << endl;
                          break;


      case 40 ... 49 :    symbol = "E";
```

```
                    code = "3";

                    cout << endl;

                    cout << "Average Year Mark: " << average << "%"  << " with Symbol " << symbol << "
and code " << code << endl;

                    break;


      case 30 ... 39 :    symbol = "F";

                    code = "2";

                    cout << endl;

                    cout << "Average Year Mark: " << average << "%"  << " with Symbol " << symbol << "
and code " << code << endl;

                    break;


      case 0 ... 29 :    symbol = "FF";

                    code = "1";

                    cout << endl;

                    cout << "Average Year Mark: " << average << "%" << " with Symbol " << symbol << "
and code " << code << endl;

                    break;


      default :   cout << "" ;

               break;


   }




}


//Question 2d

void minMax(int markEnglish,int markMaths,int markLO,int markHistory,int markComputerL,int
markGeography)
```

```
{
   int minimum = 100, maximum = 0;

   {
   if (markEnglish < minimum)
      minimum = markEnglish;

   if (markMaths < minimum)
      minimum = markMaths;

   if (markLO < minimum)
      minimum = markLO;

   if (markHistory < minimum)
      minimum = markHistory;

   if (markComputerL < minimum)
      minimum = markComputerL;

   if (markGeography < minimum)
      minimum = markGeography;
   }

   {
   if (markEnglish > maximum)
      maximum = markEnglish;

   if (markMaths > maximum)
      maximum = markMaths;

   if (markLO > maximum)
```

```
        maximum = markLO;

    if (markHistory > maximum)
        maximum = markHistory;

    if (markComputerL > maximum)
        maximum = markComputerL;

    if (markGeography > maximum)
        maximum = markGeography;
    }

        cout << "Lowest mark was " << minimum << "%" << endl;
        cout << "Highest mark was " << maximum << "%" <<endl << endl;

}

//Question 2e
void passOrFail(int markEnglish,int markMaths,int markLO,int markHistory,int markComputerL,int
markGeography)
{
    int i = 0;



    if (markEnglish >= 50)
        i++;
    else if (markEnglish < 50)
        i = i;

    if (markMaths >= 50)
        i++;
    else if (markMaths < 50)
```

```
    i = i;

  if (markLO >= 50)
    i++;
  else if (markLO < 50)
    i = i;

  if (markHistory >= 50)
    i++;
  else if (markHistory < 50)
    i = i;

  if (markComputerL >= 50)
    i++;
  else if (markComputerL < 50)
    i = i;

  if (markGeography >= 50)
    i++;
  else if (markGeography < 50)
    i = i;

    //cout << "num is " << i << endl;

    if(i>=4 && markEnglish >= 50)
      {cout << "Outcome: Passed " << endl << endl;}
    else
      {cout << "Outcome: Failed " << endl << endl;}

}
```

```
//Question 2f
void awardDistinction(int markEnglish,int markMaths,int markLO,int markHistory,int
markComputerL,int markGeography)
{

   float average;
   float sum;

   sum = (markEnglish + markMaths + markLO + markHistory + markComputerL + markGeography);
   average = sum / 6;

   if (markEnglish >= 75)
      cout << "Distinction recieved for English" << endl;

   if (markMaths >= 75)
      cout << "Distinction recieved for Mathematics" << endl;

   if (markLO >= 75)
      cout << "Distinction recieved for Life Orientation" << endl;

   if (markHistory >= 75)
      cout << "Distinction recieved for History" << endl;

   if (markComputerL >= 75)
      cout << "Distinction recieved for Computer Literacy" << endl;

   if (markGeography >= 75)
      cout << "Distinction recieved for Geography" << endl;

   if (average >= 75 && markEnglish>=50)
      cout << "Passed with distinction" << endl;
```

```
}

//Question 2g
void codeSymbol(int markEnglish,int markMaths,int markLO,int markHistory,int markComputerL,int markGeography)
{
   string code, symbol;

   switch(markEnglish)
   {
      case 80 ... 100 :   symbol = "A";
                          code = "7";
                          cout << "English            " << markEnglish << "%      ";
                          cout << symbol << "      " << code << endl;
                          break;

      case 70 ... 79 :    symbol = "B";
                           code = "6";
                           cout << "English            " << markEnglish << "%      ";
                          cout << symbol << "      " << code << endl;
                          break;

      case 60 ... 69 :    symbol = "C";
                          code = "5";
                          cout << "English            " << markEnglish << "%      ";
                         cout << symbol << "      " << code << endl;
                          break;

      case 50 ... 59 :    symbol = "D";
                          code = "4";
```

```
                cout << "English            " << markEnglish << "%      ";
                cout << symbol << "      " << code << endl;
                break;

   case 40 ... 49 :    symbol = "E";
                code = "3";
                cout << "English            " << markEnglish << "%      ";
                cout << symbol << "      " << code << endl;
                break;

   case 30 ... 39 :    symbol = "F";
                code = "2";
                cout << "English            " << markEnglish << "%      ";
                cout << symbol << "      " << code << endl;
                break;

   case 0 ... 29 :    symbol = "FF";
                code = "1";
                cout << "English            " << markEnglish << "%      ";
                cout << symbol << "     " << code << endl;
                break;

   default :   cout << "" ;
            break;

}

switch(markMaths)
{
   case 80 ... 100 :   symbol = "A";
                code = "7";
```

```
                cout << "Mathematics         " << markMaths << "%      ";
                cout << symbol << "       " << code << endl;
                break;

case 70 ... 79 :    symbol = "B";
                code = "6";
                cout << "Mathematics         " << markMaths << "%      ";
                cout << symbol << "       " << code << endl;
                break;

case 60 ... 69 :    symbol = "C";
                code = "5";
                cout << "Mathematics         " << markMaths << "%      ";
                cout << symbol << "       " << code << endl;
                break;

case 50 ... 59 :    symbol = "D";
                code = "4";
                cout << "Mathematics         " << markMaths << "%      ";
                cout << symbol << "       " << code << endl;
                break;

case 40 ... 49 :    symbol = "E";
                code = "3";
                cout << "Mathematics         " << markMaths << "%      ";
                cout << symbol << "       " << code << endl;
                break;

case 30 ... 39 :    symbol = "F";
                code = "2";
                cout << "Mathematics         " << markMaths << "%      ";
```

```
                cout << symbol << "      " << code << endl;
                break;

   case 0 ... 29 :   symbol = "FF";
                code = "1";
                cout << "Mathematics         " << markMaths << "%      ";
                cout << symbol << "      " << code << endl;
                break;

   default :   cout << "" ;
            break;

}

switch(markLO)
{
   case 80 ... 100 :   symbol = "A";
                code = "7";
                cout << "Life Orientation     " << markLO << "%      ";
                cout << symbol << "      " << code << endl;
                break;

   case 70 ... 79 :   symbol = "B";
                code = "6";
                cout << "Life Orientation     " << markLO << "%      ";
                cout << symbol << "      " << code << endl;
                break;

   case 60 ... 69 :   symbol = "C";
                code = "5";
                cout << "Life Orientation     " << markLO << "%      ";
```

```
                cout << symbol << "      " << code << endl;
                break;

    case 50 ... 59 :    symbol = "D";
                code = "4";
                cout << "Life Orientation     " << markLO << "%      ";
                cout << symbol << "      " << code << endl;
                break;

    case 40 ... 49 :    symbol = "E";
                code = "3";
                cout << "Life Orientation     " << markLO << "%      ";
                cout << symbol << "      " << code << endl;
                break;

    case 30 ... 39 :    symbol = "F";
                code = "2";
                cout << "Life Orientation     " << markLO << "%      ";
                cout << symbol << "      " << code << endl;
                break;

    case 0 ... 29 :    symbol = "FF";
                code = "1";
                cout << "Life Orientation     " << markLO << "%      ";
                cout << symbol << "     " << code << endl;
                break;

    default :   cout << "" ;
            break;

}
```

```
switch(markHistory)
{
   case 80 ... 100 :   symbol = "A";
                       code = "7";
                       cout << "History            " << markHistory << "%      ";
                       cout << symbol << "      " << code << endl;
                       break;

   case 70 ... 79 :    symbol = "B";
                       code = "6";
                       cout << "History            " << markHistory << "%      ";
                       cout << symbol << "      " << code << endl;
                       break;

   case 60 ... 69 :    symbol = "C";
                       code = "5";
                       cout << "History            " << markHistory << "%      ";
                       cout << symbol << "      " << code << endl;
                       break;

   case 50 ... 59 :    symbol = "D";
                       code = "4";
                       cout << "History            " << markHistory << "%      ";
                       cout << symbol << "      " << code << endl;
                       break;

   case 40 ... 49 :    symbol = "E";
                       code = "3";
                       cout << "History            " << markHistory << "%      ";
                       cout << symbol << "      " << code << endl;
```

```
                    break;

   case 30 ... 39 :    symbol = "F";
                    code = "2";
                    cout << "History             " << markHistory << "%       ";
                    cout << symbol << "       " << code << endl;
                    break;

   case 0 ... 29 :    symbol = "FF";
                   code = "1";
                    cout << "History             " << markHistory << "%       ";
                    cout << symbol << "      " << code << endl;
                    break;

   default :   cout << "" ;
              break;

}


switch(markComputerL)
{
   case 80 ... 100 :   symbol = "A";
                    code = "7";
                    cout << "Computer Literacy    " << markComputerL << "%       ";
                    cout << symbol << "       " << code << endl;
                    break;

   case 70 ... 79 :    symbol = "B";
                    code = "6";
                    cout << "Computer Literacy    " << markComputerL << "%       ";
```

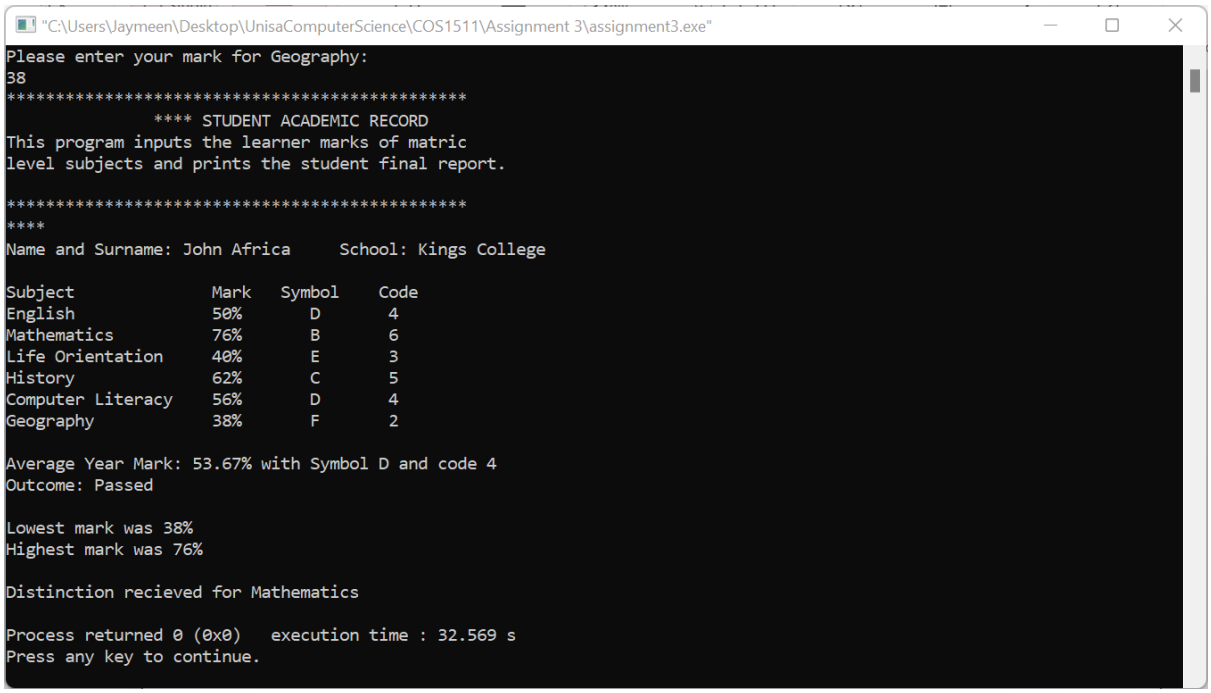
```
                cout << symbol << "      " << code << endl;
                break;

case 60 ... 69 :    symbol = "C";
                code = "5";
                cout << "Computer Literacy    " << markComputerL << "%      ";
                cout << symbol << "      " << code << endl;
                break;

case 50 ... 59 :    symbol = "D";
                code = "4";
                cout << "Computer Literacy    " << markComputerL << "%      ";
                cout << symbol << "      " << code << endl;
                break;

case 40 ... 49 :    symbol = "E";
                code = "3";
                cout << "Computer Literacy    " << markComputerL << "%      ";
                cout << symbol << "      " << code << endl;
                break;

case 30 ... 39 :    symbol = "F";
                code = "2";
                cout << "Computer Literacy    " << markComputerL << "%      ";
                cout << symbol << "      " << code << endl;
                break;

case 0 ... 29 :    symbol = "FF";
                code = "1";
                cout << "Computer Literacy    " << markComputerL << "%      ";
                cout << symbol << "      " << code << endl;
```

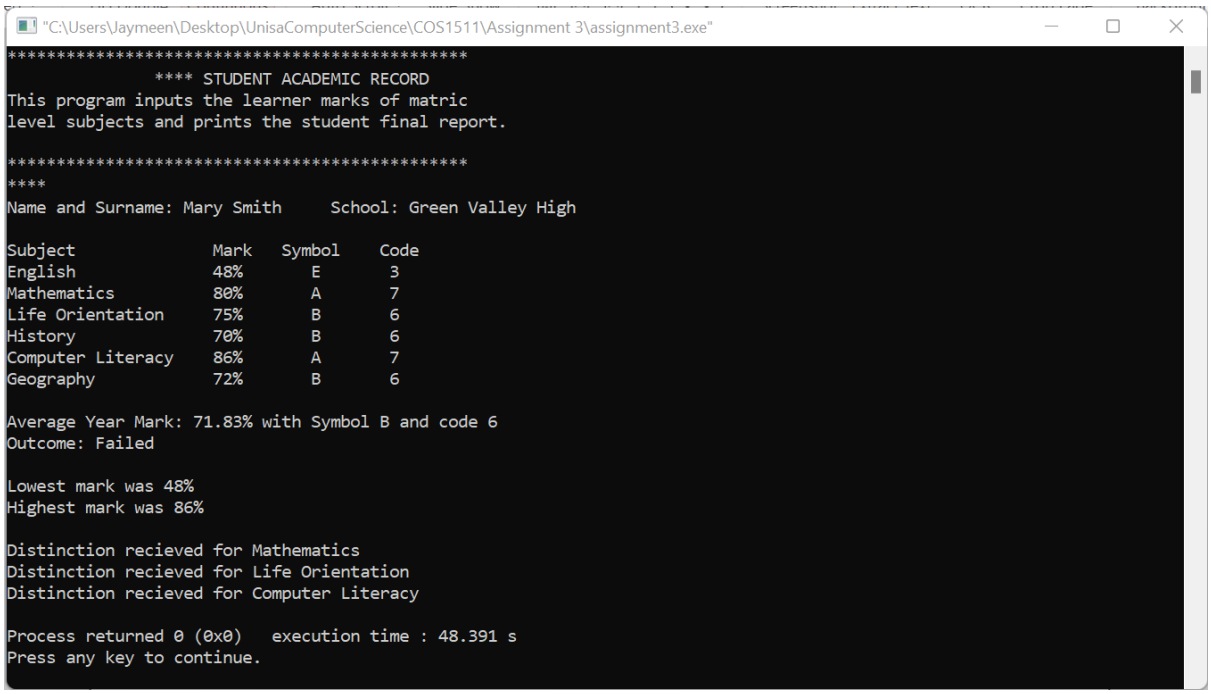
```
                    break;

    default :   cout << "" ;
                break;

}


switch(markGeography)
{
    case 80 ... 100 :   symbol = "A";
                        code = "7";
                        cout << "Geography          " << markGeography << "%      ";
                        cout << symbol << "      " << code << endl;
                        break;

    case 70 ... 79 :    symbol = "B";
                        code = "6";
                        cout << "Geography          " << markGeography << "%      ";
                        cout << symbol << "      " << code << endl;
                        break;

    case 60 ... 69 :    symbol = "C";
                        code = "5";
                        cout << "Geography          " << markGeography << "%      ";
                        cout << symbol << "      " << code << endl;
                        break;

    case 50 ... 59 :    symbol = "D";
                        code = "4";
                        cout << "Geography          " << markGeography << "%      ";
```

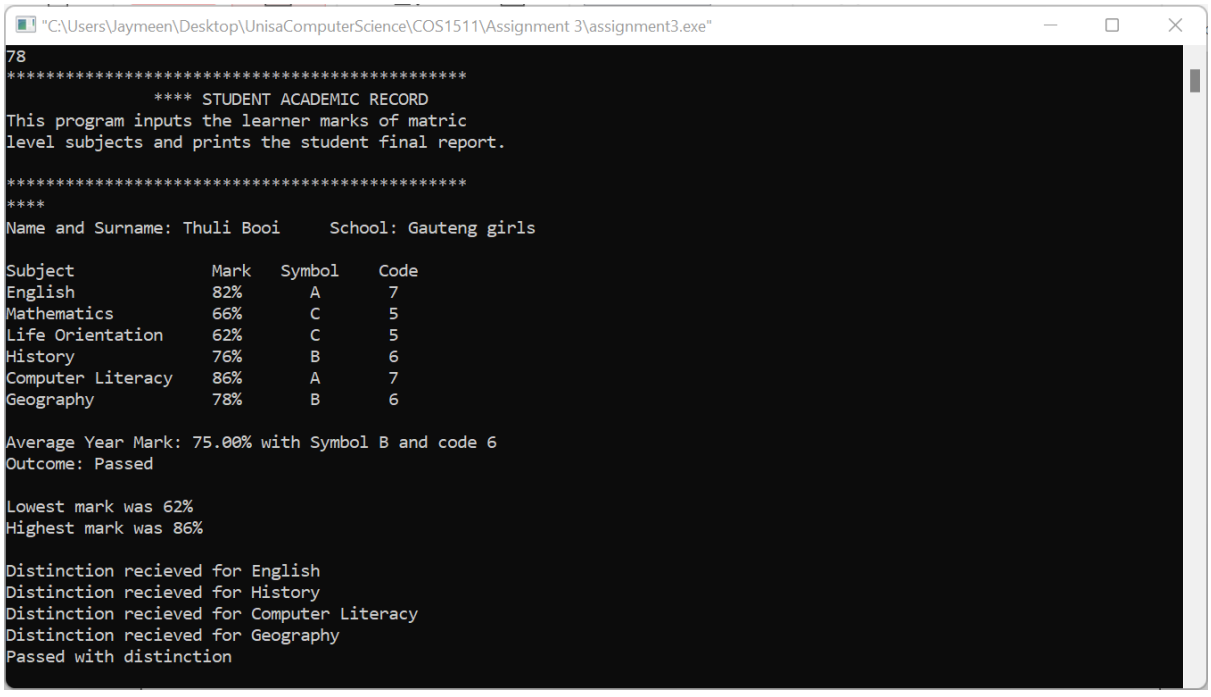
```
                cout << symbol << "      " << code << endl;
                break;

        case 40 ... 49 :    symbol = "E";
                code = "3";
                cout << "Geography          " << markGeography << "%      ";
                cout << symbol << "      " << code << endl;
                break;

        case 30 ... 39 :    symbol = "F";
                code = "2";
                cout << "Geography          " << markGeography << "%      ";
                cout << symbol << "      " << code << endl;
                break;

        case 0 ... 29 :    symbol = "FF";
                code = "1";
                cout << "Geography          " << markGeography << "%      ";
                cout << symbol << "     " << code << endl;
                break;

        default :   cout << "" ;
                break;


    }

}


//Question 2h
```

```
void displayOutput(string name, string surname, string schoolName)
{
  cout << "*********************************************" << endl;
    cout << "             **** STUDENT ACADEMIC RECORD     " << endl;
    cout << "This program inputs the learner marks of matric " << endl << "level subjects and prints the student final report." << endl << endl;
    cout << "*********************************************" << endl;
    cout << "****" << endl;
    cout << "Name and Surname: " << name << " " << surname;
    cout << "     ";
    cout << "School: " << schoolName << endl << endl;
    cout << "Subject             " << "Mark   " << "Symbol    " << "Code " << endl;
}



int main()
{
    int markEnglish,markMaths,markLO,markHistory,markComputerL,markGeography;
    float average;
    string name,surname,schoolName;


    studentDetails(name,surname,schoolName);


    getMarks(markEnglish,markMaths,markLO,markHistory,markComputerL,markGeography);


    displayOutput(name,surname,schoolName);


    codeSymbol(markEnglish,markMaths,markLO,markHistory,markComputerL,markGeography);



calcAverageYearMark(markEnglish,markMaths,markLO,markHistory,markComputerL,markGeography);
```

```
    passOrFail(markEnglish,markMaths,markLO,markHistory,markComputerL,markGeography);

    minMax(markEnglish,markMaths,markLO,markHistory,markComputerL,markGeography);

    awardDistinction(markEnglish,markMaths,markLO,markHistory,markComputerL,markGeography);



  return 0;
}
```







Question three

Line 19: first second

?	?

Line 21: first second

2	?

Line 23: first second

2	3

Line 24 → 4: [first] [second] firstP secondP

2	3	2	3

Line 6: [first] [second] firstP secondP

2	3	4	3

Line 7: [first] [second] firstP secondP

2	3	4	6

Line 8 → 24: first second

2	3

Line 25 → 10: [first] firstP [second] secondP

2	3

Line 13: [first] firstP [second] secondP

6	3

Line 14: [first] firstP [second] secondP

Line 15 → 25: first second