**Object-Oriented Application Development**

**Practical 6**

**Part A**

1. Examine and run the following program which uses an ArrayList.

|  |
| --- |
| public class Car  {  private string regNumber;  public string RegNumber  {  get { return regNumber; }  }  public Car(string number)  {  regNumber = number;  }  } |

|  |
| --- |
| using System;  using System.Collections;  class CarArrayList // using ArrayList class  {  static void Main()  {  ArrayList carList = new ArrayList();  carList.Add(new Car("ABC1234"));  carList.Add(new Car("ABC5678"));  carList.Add(new Car("ABC9999"));  for (int i = 0; i < carList.Count; i++)  {  Car c = (Car)carList[i];  Console.WriteLine(c.RegNumber);  }  }  } |

ABC1234

ABC5678

ABC9999

Press any key to continue . . .

1. Examine and run the following program which uses a multidimensional array.

|  |
| --- |
| using System;  public class JaggedArrayExample  {  public static void Main()  {  int[][] table = new int[4][];  table[0] = new int[] { 5, 2, 4 };  table[1] = new int[] { 19, 7, 8 };  table[2] = new int[] { 15, 19 };  table[3] = new int[] { 23 };  int result = 0;  for (int row = 0; row < table.Length; row++)  for (int col = 0; col < table[row].Length; col++)  result = result + table[row][col];  Console.WriteLine("The result is {0}", result);  }  } |

The result is 102.

1. Examine and run the following programs.

(a)

|  |
| --- |
| using System;  public class StringExample1  {  public static void Main()  {  string s1 = "Happy New Year";  string s2 = s1.ToLower();  string s3 = s1.ToUpper();  Console.WriteLine(s1);  Console.WriteLine(s2);  Console.WriteLine(s3);  }  } |

Happy New Year

happy new year

HAPPY NEW YEAR

Press any key to continue . . .

(b)

|  |
| --- |
| using System;  public class StringExample2  {  public static void Main()  {  string s1 = "Happy";  Console.WriteLine(s1);  string s2 = s1.Substring(3);  Console.WriteLine(s2);  string s3 = s1.Substring(1,3);  Console.WriteLine(s3);  for (int i = 0; i < s1.Length; i++)  Console.Write("{0} ", s1[i]);  }  } |

Happy

py

app

H a p p y

**Part B**

1. Consider the Country class given below.

|  |
| --- |
| public class Country  {  private string name;  public string Name  {  get { return name; }  }  private string continent;  public string Continent  {  get { return continent; }  }  public Country(string aName, string aContinent)  {  name = aName;  continent = aContinent;  }  } |

Write the code for a class that contains a Main() method which does the following:

* Create an ArrayList.
* Create 4 Country objects representing the following countries and store them in the ArrayList:

|  |  |
| --- | --- |
| *Country* | *Continent* |
| Korea | Asia |
| United Kingdom | Europe |
| Canada | North America |
| South Africa | Africa |

* Display the details of all the Counrty objects in the ArrayList.

class CountryList // using ArrayList class

{

static void Main()

{

ArrayList countList = new ArrayList();

countList.Add(new Country("Korea","Asia"));

countList.Add(new Country("UK","Europe"));

countList.Add(new Country("Canada","NA"));

countList.Add(new Country("S.Africa", "Africa"));

for (int i = 0; i < countList.Count; i++)

{

Country c = (Country)countList[i];

Console.WriteLine(c.Name + c.Continent);

}

}

}

1. Consider the Passenger and Flight classes given below.

|  |
| --- |
| public class Passenger  {  private string name;  public string Name  {  get { return name; }  }  private string passportNumber;  public string PassportNumber  {  get { return passportNumber; }  }  public Passenger(string aName, string aPassportNumber)  {  name = aName;  passportNumber = aPassportNumber;  }  } |

|  |
| --- |
| public class Flight  {  private string code;  public string Code  {  get { return code; }  }  private string departureAirport;  public string DepartureAirport  {  get { return departureAirport; }  }  private string arrivalAirport;  public string ArrivalAirport  {  get { return arrivalAirport; }  }  private ArrayList passengerList;  public Flight(string aCode, string departure, string arrival)  {  code = aCode;  departureAirport = departure;  arrivalAirport = arrival;  passengerList = new ArrayList();  }  public void RecordAPassenger(Passenger passenger)  {  // to be completed  passengerList.Add(passenger);  }  public int GetNumberOfPassengers()  {  // to be completed  return passengerList.Count();  }  public Passenger FindAPassenger(string passportNumber)  {  // to be completed  Passenger passenger = null;  bool found = false;  int i = 0;  int count = GetNumberOfPassengers();  while (i < count && ! found)  {  passenger = (Passenger)passengerList[i];  if (passenger.PassportNumber == passportNumber)  found = true;  else  i++;  }  if (found)  return passenger;  else  return null;    }  public Passenger [] GetPassengerList()  {  // to be completed  int count = passengerList.Count;  Passenger[] list = new Passenger[count];  for (int i = 0; interface <count; i++)  {  list [i] = (Passenger)passengerList[i];  }  return list;  }  } |

Complete and test the code for the following methods in Flight class:

* RecordAPassenger() method which receives a Passenger object as a parameter and adds the Passenger object to the ArrayList.
* GetNumberOfPassengers() method which returns the number of passengers recorded for the flight.
* FindAPassenger() method which receives a parameter representing a passenger passport number and returns the Passenger object with that number if found. If not found, the method returns null.
* GetPassengerList() method which returns a list of passengers for the flight as an array of Passenger objects.

//bonus question: write an app that can be used to manage info of all passengers for a flight making use of passenger and flight classes in q2.the app first ask user to input the flight details.it then display a menu with the following options:  
a) record a new passenger for the flight

b) display all the passenger for the flight

c) find a passenger using the passport number

d)exit the app

3. Write a program with a Main() method that inputs an email address as a string and does the following:

* Display the position of the ‘@’ symbol. If not found, display the message ‘No @ found’. [*Hint*: use IndexOf() method.]
* Display the characters after the last ‘.’ symbol. If no ‘.’ is found, display the message ‘No dot found’. [*Hint*: use LastIndexOf() and Substring() methods.]

(*Note*: The IndexOf() and LastIndexOf() methods return -1 if what is searched is not found.)

using System;

using System.Collections;

public class email

{

public static void Main()

{

string email, sub;

int index;

Console.Write("Enter email: ");

email = Console.ReadLine();

index = email.IndexOf("@");

if (index != -1)

Console.WriteLine("@ found at index {0}", index);

else

Console.WriteLine("No @ found");

index = email.LastIndexOf(".");

if (index == -1)

Console.WriteLine("No dot found");

else

{

sub = email.Substring(index + 1);

Console.WriteLine("The letters after the dot is {0}", sub);

}

}

}

1. Write a program with a Main() method that inputs an email address as a string and checks that there is one and only one ‘@’ symbol and displays a message accordingly. If no ‘@’ symbol is found, display the message ‘Missing @ symbol’. [*Hint*: use IndexOf() and LastIndexOf() methods and check whether both methods return the same value.]
2. public class email
3. {
4. public static void Main()
5. {
6. string email;
7. int index1, index2;
8. Console.Write("Enter email: ");
9. email = Console.ReadLine();
10. index1 = email.IndexOf("@");
11. if (index1 != -1)
12. Console.WriteLine("MIssing @ symbol");
13. else
14. {
15. index2 = email.LastIndexOf("@");
16. if (index1 == index2)
17. Console.WriteLine("Exactly 1 @ found");
18. else
19. Console.WriteLine("More than 1 @ found");
20. }
21. }