CSP1150D Programming Principles
Assignment: Individual Programming assignment ("Dice Game")
Assignment Marks: Marked out of 20, (20% of unit result)
Due Date: TBA(see moodle)

Background Information

This assignment tests your understanding of and ability to apply the programming concepts we have covered in the unit so far, including the usage of variables, input/output, data types, selection, iteration, functions, and data structures.

Pseudocode

As emphasised in the case study of Module 5, it is important to take the time to properly design a solution before starting to write code. Hence, this assignment requires you to *write and submit pseudocode of your program design* as well as the code for the program. Furthermore, while your tutors are happy to provide help and feedback on your assignment work throughout the semester, they will expect you to be able to show your pseudocode and explain the design of your code.
Write a separate section of pseudocode for each function in your program.

Assignment Requirements

You are required to design and implement a "Dice Game" program that runs a short game that uses dice. The rules of each dice game are available on moodle – make sure you do the dice game allocated to you.

Implement all the following requirements and ask your tutor if you do not understand any of the requirements.

1. The program should welcome the user and ask how many players (1...4).
2. The program should briefly explain the rules of the game.
3. Depending on the game each player should have their "turn" and the results displayed.
4. The program should keep a record of the winner of the game.
5. After the results are displayed the user should be asked if they wish to play again.
6. If they answer 'y' then the program should repeat from the beginning.

The following shows a sample run **if** the game was simply highest roll of two dice (your game WILL be different but turn order and reporting should be similar):

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How many players are there? (1..4) 3
Rolling dice for player 1...8
Rolling dice for player 2...6
Rolling dice for player 3...11
The winner was player 3 with a roll of 11
Do you want to play again? (y/n) y
How many players are there? (1..4) 4
Rolling dice for player 1...3
Rolling dice for player 2...10
Rolling dice for player 3...5
Rolling dice for player 4...6
The winner was player 2 with a roll of 10
Do you want to play again? (y/n) n
bye
>>>
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Submission of Deliverables

Once your assignment is complete, submit both your **pseudocode** (PDF or DOC format – no .pages files) and **source code** (".py" files) to the appropriate locations on moodle. An assignment cover sheet is not required but be sure to **include your name and student number at the top of both files**.

Referencing, Plagiarism and Collusion

The entirety of your assignment **must be your own work** (unless otherwise referenced) and produced for the current instance of the unit. Any use of unreferenced content you did not create constitutes plagiarism and is deemed an act of academic misconduct. All assignments will be submitted to plagiarism checking software which includes previous copies of the assignment. Remember that this is an **individual** assignment. Never give anyone any part of your assignment – even after the due date or after results have been released. Do not work together with other students on individual assignments – helping someone by explaining errors in their code/logic or directing them to the relevant resources is appropriate but doing it for them or showing them how you did it is not. An unacceptable level of cooperation between students on an assignment is collusion and is deemed an act of academic misconduct. If you are uncertain about plagiarism, collusion or referencing, simply email your tutor, lecturer or unit coordinator and ask.

Marking Key

Marks are allocated as follows for this assignment. **Criteria**	**Marks**
Pseudocode These marks are awarded for submitting pseudocode/flowcharts which suitably represent the design of your source code. Pseudocode and flowcharts will be assessed based on "does it help in understanding/describing the structure and flow of the program?"	**5**
Functionality These marks are awarded for submitting source code that implements the requirements specified in this brief. Code which is not functional or contains syntax errors will lose marks, as will failing to implement requirements as specified.	**10**
Code Quality These marks are awarded for submitting well-written source code that is efficient, well-formatted and demonstrates a solid understanding of the concepts involved. This includes appropriate use of commenting and adhering to best practise.	**5**
Total:	**20**

Dice Games

7/11 – Each player rolls two dice. If the total rolled is 7 or 11, they win. If they roll any other number they must reroll until they match their original number, however if they roll a 7 or 11, they lose. Their score is the number of rolls needed to win, lowest score wins.

Odd/even – Each player rolls four dice. For each odd number rolled the number is subtracted from their total, for each even number rolled the number is added to their total. Even numbered dice can be rerolled (once) if the player wants to try to get a higher score. The highest total wins.

Ship Dice – Each player rolls six dice. They need a 'ship' (6), a 'captain' (1) and crew. If they have a ship and captain in their roll, their crew (score) is the sum of all the other dice. If they do not have a ship and captain they can roll again, keeping a 'ship' if they have one and only rolling five dice. If on their second roll they still have no ship and captain their score is 0. The highest score wins.

Bunco – Each player rolls six dice. They score one point for each dice that matches their player number. The first player scores one point for each dice showing a one, player two scores one point for each dice showing a two and so on. Each player can hold one to five dice and reroll the others to try to get a higher score. Each player only gets one reroll. The highest score wins.

Balut – Each player rolls five dice. The goal is to make sets of dice, or a straight (all numbers 1 to 5 or 2 to 6). Highest scoring set wins. Hands are ranked as follows: five of the same number, straight, four of the same number, three of the same number, two of the same number, or highest number.

Cee-lo – First a random sequence of three dice is rolled. Then each player rolls three dice, trying to match the random sequence. They may choose how many of their dice they want to reroll, to try to better their match. Points are scored for how many dice match the sequence.

Spider – The goal is to be the first to draw a spider. Each player rolls one dice at a time, if they roll a 6 they draw the body of the spider ( ). Once they have drawn the body – if they roll a 3 or 4, they can draw a leg, or a 1 to draw an eye. Their score is how many rolls are required to complete the spider; however, they must draw the body (6) before adding to the body.

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Zilch – Each player rolls six dice. They score points based on what they roll. A one scores 100 points, five 50 points, three of the same number is the number x 100 (1000 points for three ones). However, they can reroll any dice they like trying to get a better score. If they do not score in a roll their points are scored and the next player rolls. If a player scores all six dice, they continue to roll adding to their score.

Over 12 – Each player rolls a single dice and can choose to roll again (and again) if they choose. Their total is the sum of all their rolls. The target is 12, if they go over twelve, they score zero. Once a player decides to stay the next player takes their turn.

Midnight – Each player rolls six dice to begin. The player must keep at least one, the rest are rerolled. This is repeated until all the dice have been kept. The player must keep a one and a four at some point and if they do their score is the sum of the remaining dice. If they do not have a one and a four in their final set, they score zero.

Pig – Each player rolls a single die until either a one is rolled, or they decide to hold. Their score is the sum of all the numbers rolled, unless they roll a one in which case their score is zero.

Petals around the rose – Each player rolls three dice. Their score is determined by the number of petals around the rose. Considering the rose being the centre pip on the die; a five scores four points and a three scores two points. If the player has rolled at least one rose (1, 3 or 5) they can choose to reroll all dice to try to get a better score.

Mexico - is another fun dice game with simple dynamics. The game is played with two dice for rolling, with each player being given an additional die. The die will dictate how many lives each player has after each round, so will start on a six, and deplete accordingly. After each game, the lowest dice roll will be considered the losing roll, and as such, that player will lose a life. The winner of Mexico is the player left standing after all players have rolled their dice and lost their lives.

Shut the Box - Generally played within a wooden box that displays the current numbers, each player will roll dice and use the combinations made to reach one of the numbers displayed on the wooden display. As each number is matched, the numbers within the wooden display will be flipped over. If the number 1 is the only number left showing, then players will only need to roll one dice in the hope they can reach the final number. Once a player can successfully match all the numbers, they are declared the winner, thus having to ‘shut the box’ as a result.

Yahtzee - Each player in turn places all 5 dice in the cup, shakes the cup and rolls out the dice. Each turn consists of a maximum of three rolls. The first roll must be made with all five dice. If the player chooses to roll a second and, if desired, a third time, he may pick up any or all the dice and roll again. It is the skilful use of these two optional rolls of the dice that can turn an unlucky first or second roll into a high-scoring turn. A score must be entered after the last roll in the appropriate box or a zero entered in a box of the player's choice. Each player keeps his own score on a YAHTZEE score card to be marked with the player's name.

You can find expanded and complete rules for dice games on the internet. Some have been simplified here to make the task easier.