Fundamentals of Programming
Assignment 1
(20 Marks)

You must demonstrate/explain your work to the tutor, if you are absent/unavailable or fail to demonstrate properly, zero marks will be awarded.

Please note, this is an individual assignment, and it will be checked for plagiarism. All the involved parties will be penalised if any plagiarism is found.

Please visit https://goo.gl/hQ87zg for more details.

Instructions

1. This assignment contains 3 questions. Q1 is for 8 marks, Q2 is for 5 marks, and Q3 is for 7 marks. The total assignment is for 20 marks and refer to the detailed rubric given on Assignment page in Canvas for mark allocation.
2. Submit one-word document and a zip file. Use the following format to prepare the word document (use the report template available in assignment page).

    a. Question No. (No need to copy and paste question)
    b. C++ program - copy and paste your c++ program (not the screenshot of the code)
    c. **Enough** screenshots of the output that shows **all possible outcome**.
3. Marks will be given for proper **indentation and comments.**
4. **Assignment Demonstration** is mandatory.

Other requirements:

- This assignment must be written in C++.
- Your code must have appropriate header (multiline/block) comments including your name and student number, the name of the .c file, the purpose of the program, brief explanations of variables and explanations of any code, which is not obvious to another programmer, summarising the input, output and local variables as well as expressions used in your program and test data.
- Include inline (single line) comments throughout the program describing important statements.
- Use appropriate and descriptive variable following the naming rules and conventions.
- Marks will be allocated depending on the amount of original work submitted. Marks will be deducted for plagiarised and/or un-attributed work.

Qn1. SplashKit Task (8 Marks)

When you click (left mouse button) on **Button 1** (button has a width of 50 px and height 50 px which is positioned at top left corner) on Graphics Window, it should display a custom drawing (consists of three different shapes) that you have drawn using SplashKit SDK. Create another **Button 2** on top right corner with **width 50** and **height 50**. When you click on Button 2 it should show another custom drawing consisting of four different shapes after clearing the previous one. Your custom drawings should be meaningful drawings.

Qn2. (5 Marks)

A mobile manufacturing company pays its employees as follows:

1) Team leaders (fixed fortnightly salary)
2) Sales workers ($500 plus 6.5% of their gross fortnightly sales)
3) Pieceworkers (fixed amount of money per item for each of the items they produce, each piece worker in this company works on only 1 type of item)
4) Hourly workers (fixed hourly wage for up to the first 60 hours they work and "time-and-a-half" i.e. 1.5 times their hourly wage, for overtime hours worked)

Write a program to compute the weekly pay for each employee. You do not know the number of employees in advance.

Each type of employee has its own pay code:

Code 1: Team leaders
Code 2: Sales workers
Code 3: Pieceworkers
Code 4: Hourly workers

There will be an undetermined number of entries into the payroll. Use a switch to compute each employee's pay based on that employee's pay code. Within the switch, prompt the user (i.e. the payroll clerk) to enter the appropriate facts your program needs to calculate each employee's pay based on that employee's pay code. Print each pay value and when done with the entries, print total amount of payroll.

```
Sample Run:

Enter employee's number code (-1 to end): 4
Enter hourly worker's pay rate: 10
Enter the number of hours worked: 35
fortnightly pay is: 350.00

Enter employee's number code (-1 to end): 4
Enter hourly worker's pay rate: 15.5
Enter the number of hours worked: 100
fortnightly pay is: 1860

Enter employee's number code (-1 to end): 4
Enter hourly worker's pay rate: 10
Enter the number of hours worked: 40
fortnightly pay is: 400.00

Enter employee's number code (-1 to end): 1
Enter the Team leaders's pay rate: 576.90
fortnightly pay is: 576.90
```

```
Enter employee's number code (-1 to end): 2
Enter Sales employee's gross weekly sales: 1091.45
fortnightly pay is: 570.94

Enter employee's number code (-1 to end): 3

Enter the number of pieces completed: 200
Enter the employee's per piece pay rate: 0.5
fortnightly pay is: 100

Enter employee's number code (-1 to end): 8
You have entered an invalid code.

Enter employee's number code (-1 to end): 9
You have entered an invalid code.

Enter employee's number code (-1 to end): 3

Enter the number of pieces completed: 100
Enter the employee's per piece pay rate: 2.75
fortnightly pay is: 275.00

Enter employee's number code (-1 to end): -1

The total payroll for the fortnight is:4132.84
```

Qn3. (7 Marks)

A player rolls **three** dice. Each die has six faces. These faces contain 1, 2, 3, 4, 5 and 6 spots. After the dice have come to rest, the sum of the spots on the three upward faces is calculated. If the sum is greater than or equal to 13 on the first roll, the player wins. If the sum is less than or equal to 6 on the first roll, the player loses. If the sum is 7, 8, 9, 10, 11 or 12 on the first roll, then that sum becomes the player's "point." To win, you must continue rolling the dice until you "make your point." The player loses by rolling a sum which is greater than or equal to 15 before making the point.

```
$ a
Player rolled 2 + 1 + 6 = 9
Point is 9
Player rolled 4 + 2 + 6 = 12
Player rolled 2 + 4 + 1 = 7
Player rolled 2 + 6 + 5 = 13
Player rolled 4 + 2 + 6 = 12
Player rolled 5 + 1 + 5 = 11
Player rolled 5 + 3 + 2 = 10
Player rolled 1 + 4 + 6 = 11
Player rolled 4 + 3 + 4 = 11
Player rolled 3 + 5 + 6 = 14
Player rolled 5 + 3 + 6 = 14
Player rolled 3 + 4 + 4 = 11
Player rolled 1 + 3 + 1 = 5
Player rolled 6 + 2 + 6 = 14
Player rolled 4 + 1 + 5 = 10
Player rolled 3 + 3 + 3 = 9
Player wins
```

Assignment submission information:

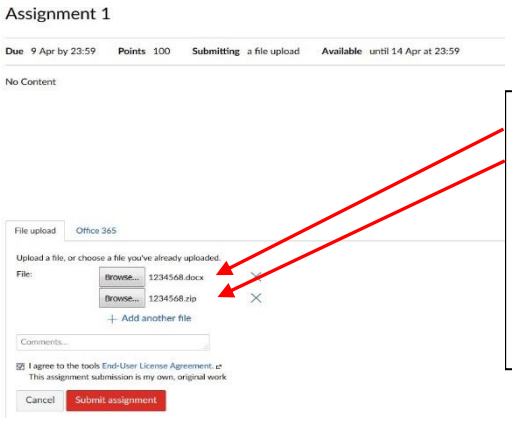
Submissions through **Canvas** must be made on or before the due date/time.
Each submission should have two files.
1. A report (name of the report should be with your student number, eg: 1012546_assignment1.docx) – use template provided with this assignment.

This report will be used for plagiarism check using Turnitin software. **20% of marks will be deducted if this report is missing for plagiarism check.** Report must (***.doc/docx)*** contain:

- Description of the problem
- A copy of the contents of the **.cpp** file for all tasks (copy and paste the code not the screenshot of the code).
- Pasted **text output** or **screen shots** of the working program resulting from the testing of the program.

2. A ***.zip*** file (name of the zip file should be your student number, eg: 1012546_assignment_1.zip) containing:

a) The actual programs (.**cpp** source codes) with comments. Programs must be named studentid_A_Qn1.cpp, studentid_A_Qn2.cpp and so on.



Make sure two files are selected separately for submission as shown in this figure.
Give names:
studentid_Assignment_1.docx
studentid_Assignment_1.zip

Marking Criteria – Refer to rubric given in Assignment page.

End of Assignment