**Internal Assessment Resource**

Achievement Standard Digital Technologies

**Resource title**

**Reflex Tester Game**

**Due Date: 22 March 2018**

**91883: Develop a computer program**

**Version 1, Credits 4, Level 1**

|  |  |  |
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| **Achievement** | **Achievement with Merit** | **Achievement with Excellence** |
| Construct a computer program. | Develop an informed computer program. | Develop a refined computer program. |

**91884: Use basic iterative processes to develop a digital outcome**

**Version 1, Credits 6, Level 1**

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| **Achievement** | **Achievement with Merit** | **Achievement with Excellence** |
| Use basic iterative processes to develop a digital outcome | Use basic iterative processes to develop an informed digital outcome | Use basic iterative processes to develop a refined digital outcome |

# Student instructions

## Introduction

This assessment task requires you to make a basic program which measures the reflexes of the user. You will be assessed on how efficiently you make the program and how well the program works. The iterative processes you have undertaken to complete it are also being assessed. Please see the checklist at the end of these instructions for more information on how this task will be assessed.

***This is an individual assessment activity.***

Create a program which measures the time it takes to click on dots that are displayed at random co-ordinates on the screen.

## Specifications

Create a program for the following specifications:

* All dots have a radius of 20 pixels
* The program will ask the user how many dots there will be. The allowed range is 2 to 10. It will make the user enter the number again if the input is out of bounds or invalid.
* Only one dot is displayed at a time
* Dots will be placed randomly in a 500x500 canvas but not overlapping the edge
* Time is measured from the time the first dot is clicked through to when the last dot is clicked.
* After the last dot is clicked, the score will be displayed and the game will be reset ready for the first dot to be clicked again.
* The program will keep track of the fastest time and will ask for a name if you have obtained a new fastest time.
* The click must be within 20 pixels of the dot’s centre to register.

## Key Stages

List the key steps you will need to undertake to complete this project

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| 1. Through out all the steps I will fill in my progress log 2. I will need to start working on my program until it is almost completed 3. The I need to work on my document until I can’t work on it unless my reflex tester is finished 4. I will finish my Reflex tester 5. I will finish my |

## Planning the Logic

Explain with either Pseudocode, Flowcharts or Natural Language how the program will work. The algorithm must clearly show how the reflex time can be measured.

|  |
| --- |
| <!DOCTYPE html>  <html>  <head>  <title>Reflex Tester</title>  <script src="jquery\_template.js"></script>    <script>  (var = variable and const = constant)  Var mouse={x:0,y:0}  Var current State = Start Up  Var number of dots=2  Var number of clicks=0  Var dot = {x:0,y:0, radius:20}  Var seconds = 0  Var highest score = 1000  Var name = “no name”  Var new name = “”  Var start Time;  Const Start Up=0  Const In Game=1  Const Game Over=2  Const Enterkey=13  Const Escape key=27  Const Restart Key=82  Const Retry Key = 82  Function setup  Run Place the dot function  if someone clicks with their mouse  offset the position where they clicked onto the canvas  if you clicked on the dot  Run place the dot function  Add 1 to number of clicks  if Number of clicks == 1  Start time = get system time  If number of clicks == number of dots  Seconds= (get system time – start time)/1000  current state = Game Over  If (seconds < hisghest score)  hisghest score = seconds  display "Good job you have the best score"  newername=prompt "What is the name of this winner?"  "Insert Name" + seconds  name = newername    If somebody clicks a key  if(ENTER KEY is pressed && currentState==START\_UP)  currentState=IN\_GAME;  hide the range slider  else if(RESTART\_KEY && currentState == GAME\_OVER)  refresh the page  else if(RETRY\_KEY is pressed && currentState == GAME\_OVER)  currentState=START\_UP  run function resetAll  when the range slider is used  numberofdots=value of the range slider  hide the range slider  function get system time  return new date get time    function main game loop  requestAnimationFrame(mainGameLoop)  if(current State==START\_UP)  render StartUp Screen  else if(current State==IN\_GAME)  render InGame Screen  else if(current State==GAME\_OVER)  render GameOver Screen  function resetAll  current State = START\_UP;  show range slider  numberofclicks=0  numberofdots=value of range slider  newername="0";    function Place the dot  dot's x = random number between 0-500  dot's y = random number between 0-500    function render in game screen  colour = light blue  draw rectangle (y's location from 0 to 500, x's location from 0 to 500)  colour="#292264"  beginPath  draw a circle (dot's x,dot's y,dot's radius)  fill n the dot  colour="black"  font="20pixels Comic Sans MS"  place Text(numberofclicks, 20, 20)  font="20pixels Comic Sans MS"    function render StartUp Screen  colour="#AABFEB"  draw rectangle (y's location from 0 to 500, x's location from 0 to 500)  colour="black"  font="60px Comic Sans MS"  place Text("Reflex test", 20, 100)  font="20px Comic Sans MS"  place Text("How many dots do you want?", 20, 200)  font="20px Comic Sans MS"  place Text("Push enter to start", 20, 220)  font="20px Comic Sans MS"  place Text(rangeslider's value, 170, 240)  font="20px Comic Sans MS";  place Text("Amount of dots:", 20, 240);  font="20px Comic Sans MS";  place Text("Highest Score:"+name+":"+highestscore, 20, 260);    function renderGameOverScreen()  colour="#AABFEB"  draw Rectangle(y's location from 0 to 500, x's location from 0 to 500)  colour="black"  font="60pixels Comic Sans MS"  place Text("Test Over", 20, 100)  font="20pixels Comic Sans MS"  place Text("Press R to refresh page", 20, 200)  font="20px Comic Sans MS"  place Text("Space to Restart", 20, 225)  font="20px Comic Sans MS"  place Text("Your score:"+ seconds+ "seconds", 20, 250)        </script>  </head>  <body>    <canvas id='stageCanvas' width=500 height=500 style='marjin:0px;'+"border:1px solid #000000;"></canvas>  <div class="slidecontainer">  From 2-10, thanks<input id='dotchooser' type="range" min="2" max="10" value="2" class="slider" id="myRange">// this the range slider    </div>  <embed src="Penny - Nickel.mp3"" autostart="true" loop="true" hidden="true" \>//this is a song that will play in the background    </body>    </html> |

## Coding Requirements

* The program must contain sensible variable/function names which use consistent naming conventions. IE camel case for variables and functions, capitalised constants and function names containing verbs. Code must be indented appropriately. Use constants for values which do not change.
* Code comments must be included which describes how the program functions.
* You need to divide the program logic across two or more functions.

## Own Enhancements

You will have an opportunity to implement your own enhancements to make the overall outcome higher quality.

Use A B testing to find what is best for the outcome. Survey your friends to ask which they prefer. For example if most people like option A then that’s what you shall implement. Below is an example. Add your own enhancements.

|  |  |  |
| --- | --- | --- |
|  | A | B |
| Would people prefer to type in a box or use a range slider to determine how many dots they want to work with | Range slider  13 votes | Fill in box  11 votes |

Outline the benefits of the enhancements you’ve made

|  |
| --- |
| When the person is selecting the amount of dots they can’t go out of the 2-10 range  You can’t mistakenly make a typo with the range slider |

## Test Plan

Prepare a test plan that verifies each of the specifications. The first two columns are filled out before the program is made. The third and fourth columns should be filled out during and at completion of the program. Each of the specifications must be addressed in the test plan. Below is a template. Add as many rows as you need. The test plan must cover what should happen if unexpected value are entered.

|  |  |  |  |
| --- | --- | --- | --- |
| Test Case | Expected Outcome | Actual Outcome | Pass / Fail |
| * All dots have a radius of 20 pixels * The program will ask the user how many dots there will be. The allowed range is 2 to 10. It will make the user enter the number again if the input is out of bounds or invalid. * Only one dot is displayed at a time * Dots will be placed randomly in a 500x500 canvas but not overlapping the edge * Time is measured from the time the first dot is clicked through to when the last dot is clicked. * After the last dot is clicked, the score will be displayed and the game will be reset ready for the first dot to be clicked again. * The program will keep track of the fastest time and will ask for a name if you have obtained a new fastest time. * The click must be within 20 pixels of the dot’s centre to register. | I expect it would work on the first try because it is very easy to do  I would have a range slider so they can’t go out of bounds  I will only have one dot that will be moved if it is clicked on  I will have function that will place it randomly between a certain range  I will have a counter when the dot is clicked and when the dot is first clicked it will start the timer when the amount of dots you’ve clicked is equal to the amount of dot you’ve chosen stop the timer and show the result on the game over screen  When the amount of dots you have clicked is equal to the amount you choose stop the timer and go into game over screen where it will display you your time which is your score  I’m going to have 4 variable my scoring variable and name variable  And if the person gets a better score than the high score the high score will change to the new high score and ask for a name and it will change the high score name to the name they have inputted    I will use a math equation to draw my radius around the dot and if the person clicks within the radius it will go to the next but if the person outside of the radius it doesn’t do anything but logging where the person has clicked | I did it on the first try by telling it’s radius in it’s global variable  I got my range slider to work and they can’t go out of bounds  The dot changes position after being clicked on  My function works and the dot doesn’t overlap  My expectation and plan for it worked  My expectation worked and nothing seems to be wrong  When I have finished clicking my dots and I have gotten a better score than the high score It asks my name and when I go to the start up screen I see my name with my score  Every time when I click outside the dot nothing happens when I click in the dot the next one appears | Pass  Pass  Pass  Pass  Pass  Pass  Pass  Pass |

## Implications

Some the following implications may be need to be considered while completing the program.

* social
* cultural
* legal
* ethical
* intellectual property
* privacy
* accessibility
* usability
* functionality
* aesthetics
* sustainability and future proofing
* end-user considerations
* health and safety

Describe why some of these implications will be important to consider during the creation of the program and how you will address the relevant implications.

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| --- |
| Aesthetics will be important because when people are going to be doing the test they most likely want to see something that would be appealing. I’m pretty sure people would rather see some text and dots rather than having a horrible image in the background and a basketball for a dot.  This can also apply to what fonts I’m going to be using and how my alerts would look like.  Usability will also be very important because the person that is taking the test might not have certain keys on their keyboard that program might be using so I made the keys that are being used in the program are universal to all keyboards.  Privacy is very important to myself and I hope it is also important to other people. In my program the person taking the test will have their privacy because I’m not hosting it on any website so it would be run on their computer so the person can check if I have violated their privacy which I have not, the only remote thing that could be asking info about them is just an alias for the new champion of the reflex tester.  This program has no way to break the law unless someone changes it so it can but the one I made can’t hurt anyone in any way or form unless people let themselves be hurt by the program. There is also no reason for me to break the law when I’m 16, I don’t want to ruin my future. |

## Progress Log

Each lesson that you work on this project you must document each iteration of development. This includes:

1. What part of the program you plan to work on
2. What part of the program you developed
3. What happened as you trialled it
4. An evaluation of how it went
5. what needs to happen next

Below is a template you could use. Add as many rows as you need.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date | I plan to: | I worked on: | This happened when I trialled it: | I need to do this next: |
| 1/3/2018  5/3/2018  6/3/2018  7/3/2018  8/3/2018  9/3/2018  12/3/2018  13/3/2018  14/3/2018  15/3/2018  19/3/2018  20/3/2018  21/3/2018  22/3/2018 | To make different render screens for my reflex tester  I need to make sure I have the proper amount of render screens for my tester  I need to place my dot on the canvas  I need place my dot with my game over zone  I am going make the collision with my dot work  I need to ad an offset to my collision to fix the  Collison position  To fill in all my requirements on the document  I need to fill in all my requirements on my document  I need to write my pseudocode  I am going to see what own enhancements I could do to my program  I am going to finish my program  I am going to ask my teacher to help me finish my program  I am going to change how people put in their name into the program  I am going to finish my document and print everything out | The program for the reflex tester  The program for the reflex tester  The program for the reflex tester  The program for the reflex tester  The program for the reflex tester  The program for the reflex tester  My assessment document  My assessment document  My assessment document  My reflex tester program  My reflex tester program  My reflex tester program  My reflex tester program  My assessment document | My render screens worked but I have too many screens  I have removed the pause screen and I have removed the restart key  I have not been able to place it but I can place a game over zone  I have placed my dot but I realised I don’t need my game over zone  I have made my collision work but it isn’t set on my canvas and it is placed on my page  I had the teacher help me and we made a console logger to see how much it is offset and we fixed it and I have it finish when I reach the range slider  I have filled in most of my date records of what I did on those days  I have finished my date record of what I did those days and  I barely did anything because I was working on my high scores for my program  I have gotten my results to put in a range slider  I have not finish my program because I couldn’t get my scores defined  I helped some of my friends with their programs and the teacher and I was unsuccessful because of the way the names are entered for the program  I have finished my program and I worked a little on the program | I need to remove my other unneeded render screens  I need to start working on placing my dot  I need to place my dot with my game over zone  I need to make the collision on my dot work  I need to add an offset to placing my dot to fix the collision problem  I need to make a counter for how many dots I’ve clicked and end the game when I reach the range slider  I need to finish my assessment document  I need to finish my assessment document  I need to finish my program  I need to finish my document and program  I must finish my program  I need to find a different way for people to enter their name.  I need to finish my document |

## Marking Schedule

You are being graded on two achievement standards. It is pos

sible to achieve one and not the other. Some elements may be marked holistically.

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| **91884: Use basic iterative processes to develop a digital outcome** | | | |
| planning a digital outcome to address a problem, need, opportunity, or interest | A |  |  |
| managing the development by decomposing the digital outcome into smaller components |  | M |  |
| trialling components of the outcome in an iterative manner | A |  |  |
| testing that the digital outcome functions as intended |  | M |  |
| using information from testing and trialling to improve the outcome |  | M |  |
| trialling multiple components and/or techniques and selecting the most suitable |  | M |  |
| describing relevant implications | A |  |  |
| addressing relevant implications. |  | M |  |
| applying information from the planning, testing and trialling of components to develop a high-quality outcome. |  |  | E |

First Attempt: Not Submitted Resub Required Achieved Merit Excellence

Final Attempt: Not Achieved Achieved Merit Excellence

Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Teacher\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| **91883: Develop a computer program** | | | |
| writing code for a program that performs a specified task using a suitable programming language | A |  |  |
| setting out the program code clearly | A |  |  |
| documenting the program with comments | A |  |  |
| documenting the program with variable names and comments that describe code function and behaviour |  | M |  |
| following conventions for the chosen programming language |  | M |  |
| ensuring that the program is a well-structured, logical response to the task |  |  | E |
| making the program flexible and robust |  |  | E |
| testing and debugging the program to ensure that it works on a sample of expected cases. | A |  |  |
| testing and debugging the program in an organised way to ensure that it works on expected and relevant boundary cases. |  | M |  |
| comprehensively testing and debugging the program. |  |  | E |

First Attempt: Not Submitted Resub Required Achieved Merit Excellence

Final Attempt: Not Achieved Achieved Merit Excellence

Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Teacher\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_