

# CHALLENGE

## 2.3

### RACE GAME



v 1.3



# COURSE DESCRIPTION

<b>Course name:</b>	Basecamp 2, Challenge 3
<b>Course code:</b>	INFBC01-23
<b>ECTS:</b>	1 ECTS
<b>Study points and workload:</b>	This elective provides you with 1 study point (EC). The study workload is at least 28 hours during Challenge Week.
<b>Prior knowledge:</b>	The challenge is a logical continuation of the program in Basecamp. The level of the challenge is aligned to Basecamp's program of Arch 3.
<b>Working method:</b>	Students work during Challenge Week in a team of 2 students. Students work independently on location and online. Teachers and peer coaches will be available for support.
<b>Testing:</b>	A race game that meets the minimum requirements as described in this document. A minimum effort of 28 hours per person is expected. Students keep a logbook for this purpose.
<b>Learning materials:</b>	All Basecamp material, online content.
<b>Content:</b>	Students make a race game in pygame, covering programming concepts from Arch 1, Arch 2 and Arch 3.
<b>Notes:</b>	Although there are minimum requirements, creativity is stimulated!
<b>Course coordinator:</b>	Xenia Hasker, John Grobben
<b>Date:</b>	18-4-2024

## 1. Introduction

Week 12 is designed as a flexible week. If everything is going well, you will do this challenge assignment. If you experience difficulties, you can use this week to get back on track. 'Back on track' is described in another document.

## 2. The challenge

*Make a race game with tire (aka tyre) strategy!*

### Introduction

Pygame is a powerful library for the development of games with graphics. It is well documented and there are tons of examples and tutorials available on the internet. *Team size is 2*. For the challenge we recommend a multi-phase approach:

- Grasp the basics of pygame, experiment with it
- Build a basic racing game (oval circuit, car, steering)
- Add the opponent, pit stops and tires
- Add the score and round number
- Add more things you like

### Goal

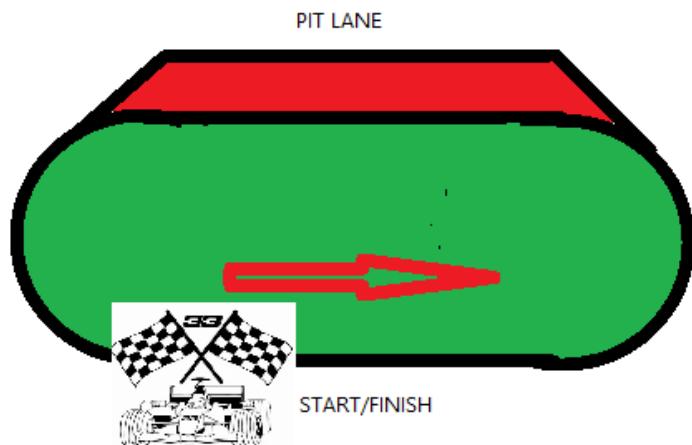
The goal of the game is to win from the computer car and/or to improve the high score.

### General description

The player steers a racecar with his keyboard (arrow keys for example). The player plays against a car controlled by the program. Collisions and crashes decrease the speed and therefore the end score.

### Layout

The basic layout of a circuit is an oval with a pit lane, but probably you want to make a more realistic shape 😊 :



## Basic game

The minimal game consists of:

- A car steered with keyboard
- A computer opponent (basic behavior)
- A track with a pitlane
- Tire change (hard, medium, soft)

## Tire strategy

The player has the possibility to enter the pitlane and change tires (this takes time of course)

There are three versions: soft, medium, hard:

- Soft tires – These represent the fastest rubber, but are likely to wear out before the harder compounds do.
- Medium tires – This is the compromise compound. It's usually slower than the softs but faster than hards. And it should last longer than the softs, but not as long as hards!
- Hard tires – These provide the least grip, but are supposed to remain in working order the longest.

## Extra game elements

You are free to make your game better. Here are some ideas:

- More opponents
  - (high) Score
  - Dangers (oil, crashed cars, pigeons, ...)
  - Safety cars
  - Accidents
  - More circuits
  - Levels
- Rain (more tires needed!)

## Tips

- Take time to follow tutorials and try out some principles
- Start simple
- Make a broad circuit, to prevent too many accidents
- Use key like P, S, M and H to make a pit stop and change tires

## 3. Requirements

Minimal: a race game with:

- 1 player car and 1 computer car
- Simple collision detection
- Steering with keyboard
- Pit stops and tire choice

Extra (if you are more experienced):

- More game elements (complete freedom here)

## 4. Planning

- Week 11 decision challenge or back to track, make plan for “back on track” or read this challenge document.
- Week 12: working on challenge or back on track, visit guest lecture, feedback session, handing in
- Week 13: show products to teachers (and other students), play them!

## 5. Deliverables

You work in a team of 2 students. If you finish this challenge satisfactorily, you get 1 study point (EC) for the elective (keuzevak) Basecamp Challenge 3.

- The game is made with pygame, submitted on code base
- Meet the minimal requirements (see description above)
- Logbook – minimum time investment of 28 hours per student. Use this [logbook](#) format.
- Submit a ZIP-file in Code Grade with your code and logbook (assignment A3W12C3)

## 6. Deadline

Due to Ascension (Hemelvaart), we have a shorter challenge week. This has been taken into account in the assignment and deadline. You can submit this challenge a day later.

- Deadline classes BC21A to BC21D: Monday 13 May before 23.59
- Deadline classes BC21E to BC21G: Tuesday 14 May before 23.59
- Too late is NVL (niet voldaan)!

## 7. Grading

The challenge is a team effort, to which the students contribute individually. The grade is on an individual base. To qualify for a passing grade for this challenge, you must meet the following prerequisites and requirements:

Prerequisites	Fulfilled	Not fulfilled
Delivery before deadline		
Proof minimum investment of 28 hours (by logbook)		
Learning goal	Weight factor	Taxonomy (Miller)
You meet the minimum requirements as described in this document (see point 3).	100%	Knows how/Shows how
<i>Pass mark (cesuur): the prerequisites must be fulfilled, the game must meet the minimum requirements in order to receive a 'VLD' (voldaan).</i>		

All students who subscribed to this challenge, will be graded with a 'VLD' (voldaan/fulfilled) or 'NVL' (niet voldaan/not fulfilled).

## 8. Retake

In case of a 'NVL' or if you do not meet the prerequisites, you have to take part in the resit. The assignment for the resit is decided and communicated by the Basecamp teachers. Before starting the resit make sure the assignment is clear. The challenge has to be finalised within the Basecamp period.

**Use your creativity and enjoy!!!**

## ASSESSMENT FORM

Student name		
Student number & Class		BC11
Teacher name(s)		
Prerequisites	Fulfilled	Not fulfilled
Delivery before deadline		
Proof minimum investment of 28 hours (by logbook)		
Learning goal	Weight factor	Taxonomy (Miller)
You meet the minimum requirements as described in this document (see point 4).	100%	Knows how/Shows how
<i>Pass mark (cesuur): the prerequisites must be fulfilled, the game must meet the minimum requirements in order to receive a 'VLD' (voldaan).</i>		
Explanation	Grading	
	VLD / NVL	