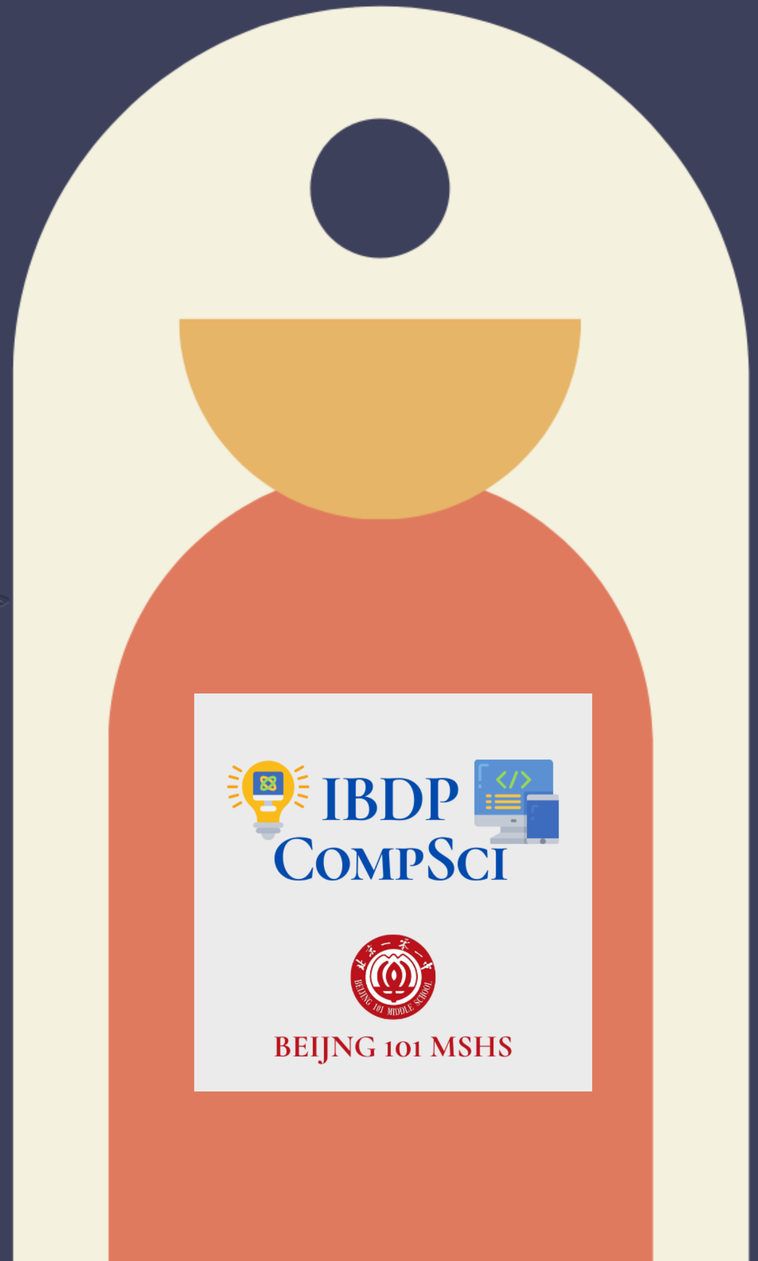
Welcome to Computer Science ***IBDP***

Beijing 101 Middle/High School



Highlights from Last time

- Introduction to Pseudo code
- Comparison between Algorithm, Pseudo Code and program.

Today

- Iterations associated with a given decision in a specified problem.
- Decision and Conditional statements.

Iterations

♥ Iteration is the term given to the repetition of a block of instructions (code) within a computer program for a number of instances or until a status is encountered.

♥ When the first group of instructions is carried out again, it is called an iteration.

♥ When a cycle of instructions is carried out in a repeated manner, it is called a loop.

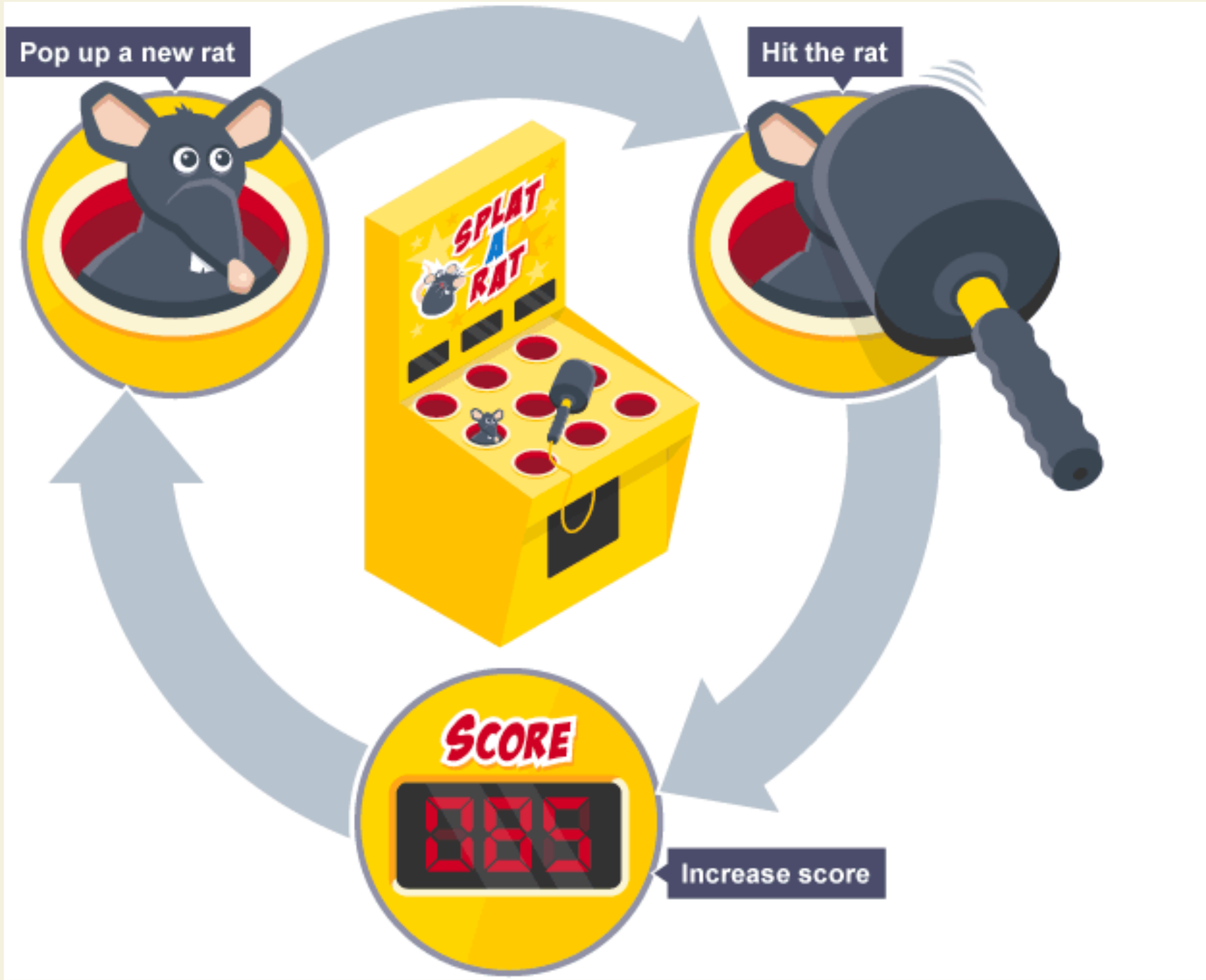
♥ It is the replication of a process in a computer program, commonly executed with the use of loops.

Iteration and its importance

♥ lets a programmer streamline a design by declaring that definite steps will be repeated.

♥ Iteration allows us to simplify our algorithm by stating that we will repeat certain steps until told otherwise.

♥ makes designing algorithms quicker and simpler because they don't have to include lots of unnecessary steps.


Pop up a new rat
Hit the rat
SPLAT A RAT
SCORE
Increase score

Eating breakfast

ALGORITHM FOR EATING BREAKFAST CEREAL MIGHT CONSIST OF THESE STEPS:

- ♥ PUT CEREAL IN BOWL
- ♥ ADD MILK TO CEREAL
- ♥ SPOON CEREAL AND MILK INTO MOUTH
- ♥ REPEAT STEP 3 UNTIL ALL CEREAL AND MILK IS EATEN
- ♥ RINSE BOWL AND SPOON

THE ALGORITHM WILL REPEAT STEPS 3 AND 4 UNTIL ALL THE CEREAL AND MILK HAS BEEN EATEN.

Types of Iteration

- Count-controlled loops
- Condition-controlled loops

Count-controlled loops

- ♥ used for iterating steps a specific number of times.
- ♥ used when the number of iterations to take place is already known.
- ♥ uses a counter to keep track of how many times the set of commands has been repeated.

Count-controlled loops

- Count-controlled loops are executed using FOR statements.
- for – specifies the starting point of the iteration
- range – indicates how many times the program will iterate

Count-controlled loops-Example

```
total = 0
for count in range (4):
number = int (input (“Type in
a number: “))
total = total + number
print (“The total is: “)
print (total)
```

Condition-controlled loops

♥ used for iterating steps continuously until a condition is met.

♥ used when the number of iterations to take place is unknown.

♥ The algorithm tests the condition to see if it is true.

♥ If true, the algorithm executes a command. If false, the algorithm goes back to step 1 and will continue to go back until the condition becomes true.

♥ Condition-controlled loops are executed using WHILE statements.

Condition-controlled loops- Example

```
total = 0
answer = "yes"
while answer = "yes":
number = int (input ("Type in a number: "))
total = total + number
answer = input ("Any more numbers? yes/no ")
print ("The total is: ")
print (total)
```

Cut Block Handout in Teams

Answers

Here is the answer to the second puzzle.

1	4	2
2	3	1
1	4	2
3	5	1

Here is the answer to the harder third puzzle.

1	3	2	5	3	2	3
2	4	1	4	1	4	1
1	3	2	3	2	3	2
2	4	6	1	4	1	4
3	1	5	2	3	2	5
2	4	3	1	5	1	4

Next Week

- Decision required to solve a solution to a specified problem
- Decision and Conditional statements.
- Logical Rule for a real world.

Thank you and see you next time.