Breve introduzione all'informatica

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- Primo problema: ➔ cosa?
  - Per matematica, fisica, scienze …. ormai esistono indicazioni collaudate dei curricula per i vari livelli di età scolastica
  - per l'informatica si sta a fatica diffondendo la convinzione che qualcosa ci debba essere ma le molte proposte di cosa ci debba essere sono ancora in discussione

Riferimento:

ACM & Informatics Europe Report, Informatics Education: Europe cannot afford to loose the boat, April 2013,

http://www.informatics-europe.org/images/documents/informatics-education-europe-report.pdf

- **Secondo problema**: breve introduzione
  - ➡ cosa delle **molte** proposte?
  - tra l'altro dobbiamo tener conto delle diverse esposizioni all'informatica di chi ci ascolta
  - gestendo la transizione cioè aggiornando i temi via via che si andrà verso una presenza consistente del digitale nelle scuole.

Riferimenti:

- CSUNPLUGGED
- Programmailfuturo, proposta di MIUR e CINI (*Consorzio Interuniversitario Nazionale per l'Informatica*)
- CAS (Computing at school), inglese
- Bebras, proposta dalla Lituania ora in molte nazioni

FIRST MEETING

During our first meeting I propose an unplugged activity of problem solving yet ending with describing, in a pseudo programming language or using flow diagrams, the solution we agree upon.

- ***Step-1**) I say aloud a sequence of numbers, they can be temperatures for example, the attendees have to find the highest among them. They are not allowed to use paper or something else, they have to use their mind onl*y. Only not to be confused numbers are positive integers.

FIRST MEETING cont.

- **Step-2)** *Each one writes down the process followed to find the solution of the problem in step-1:*

  - *Let's see and discuss some descriptions: are they precise? i.e. someone having no idea of how to perform the given task can get to the solution?*

FIRST MEETING cont.

- **Step-2)** *Each one writes down the process followed to find the solution of the problem in step-1:*
  - *Let's see and discuss some descriptions: are they precise? i.e. someone having no idea of how to perform the given task can get to the solution?*

OSSERVAZIONI:

- Scrivere le varie azioni in disordine: non va bene
- Per scegliere tra due diverse sequenze di azioni: come facciamo? Bisogna esprimere:
  - la causa per cui si sceglie l'una o l'altra sequenza
  - poi esprimere le due sequenze differenti

FIRST MEETING cont.

- **Step-3)** *Each attendee considers again his description of the process followed to find the solution of the problem in step-1:*

  – *Is the description general wrt the number of temperatures, i.e. does it explain how to work no matter how many numbers are given?*

REMARKS:

– Si potrebbe tornare indietro a eseguire azioni giá fatte per non ripetere?

  - Important , we'll come back

– Eseguire n volte oppure eseguire finché ho un numero in ingresso uguale a -100 per esempio

FIRST MEETING cont.

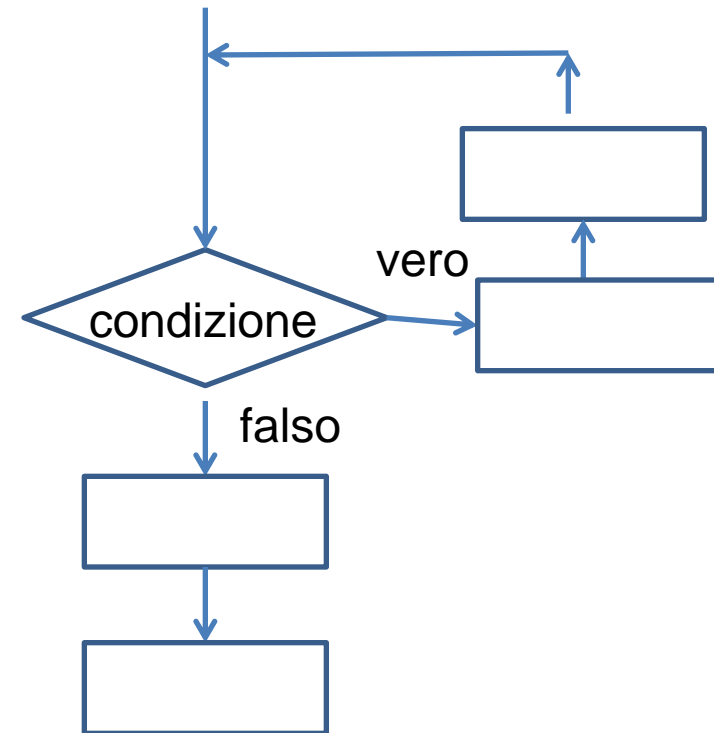- **Step-3)** *Each attendee considers again his description of the process …………..*
  - *Is it general wrt the number of temperatures?*

REMARKS:

- Si potrebbe tornare indietro a eseguire azioni giá fatte per non ripetere?
  - Avere la possibilitá nel linguaggio di specifica di rifare per un certo numero di volte oppure *rifare fintanto che vale una condizione. Es.* Eseguire n volte oppure eseguire finché ho un numero in ingresso uguale a -100 per esempio
  - *discutere*

FIRST MEETING cont.

- **Step-4)** *Let's find a way to specify the process that all of us understand. We can choose flow diagrams or a pseudo language or both.*
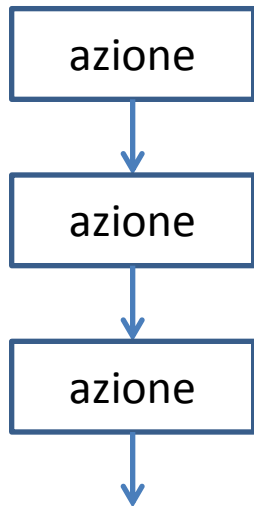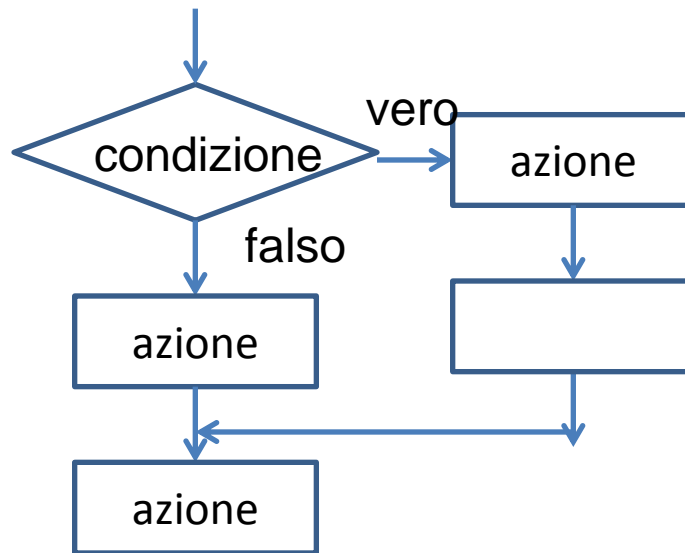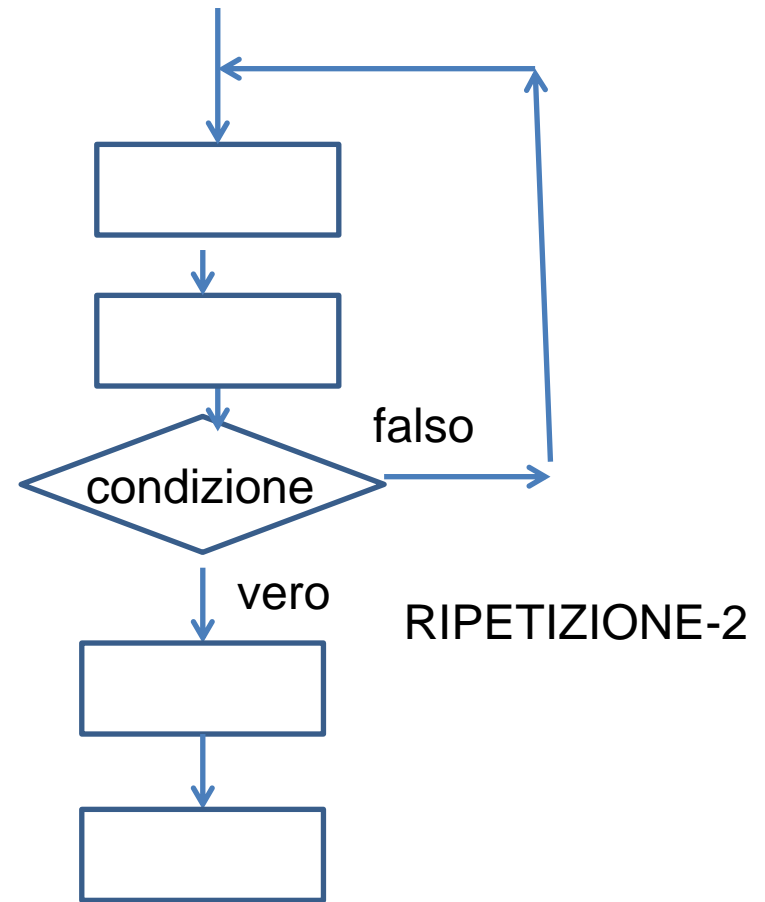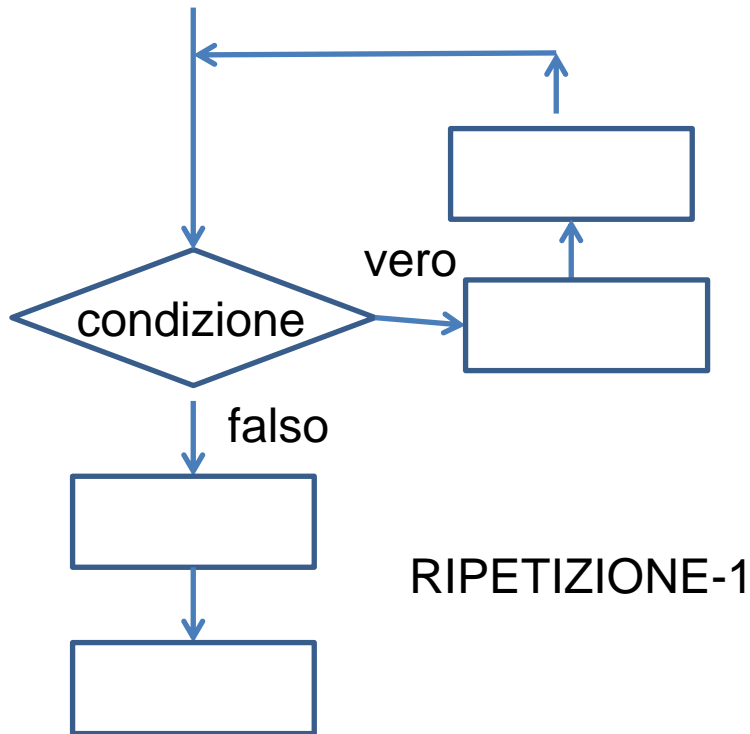

SEQUENZA   SELEZIONE   RIPETIZIONE

FIRST MEETING cont.

RIPETIZIONE-1

vero

condizione

falso

RIPETIZIONE-2

falso

condizione

vero

Diverse forme di ripetizione:
- *rifare fintanto che vale una condizione -* RIPETIZIONE-1
- *rifare fino a che vale una condizione -* RIPETIZIONE-2

FIRST MEETING cont.

We have not yet used our laptops: we are going through some preliminary activities that will allow us to see that some activities related to the computer are near to what we do in our everyday lives without computers.

- **Step-5)** *Finally we have an activity on ONE laptop: we go through a story in Scratch, for example the Nocturnal animals story, with a short presentation of the Scratch environment. Without looking at the scripts, we think what happens if we try to specify (part of) the story using the way to specify a process decided in step-3.*

FIRST MEETING cont.

- **Step-6)** *Short description of the Scratch environment introducing the characters and the scripts specifying their behaviors in a formal language.*

- *Assignment-*1: download **scratch**.mit.edu/**scratch_**1.4

- *Assignment-*2: translate the dialogues in the story seen in step-4 and step-5 using the language you like better.

- ***Accomplishments***: 1. we need a "special" language to precisely tell to someone else how to perform a task.

  2. in this language we need to be able to express sequences, selection of sequences and the going-back&repeat of actions

Ambiente virtuale in cui collaboriamo:

1. http://orientamento.educ.di.unito.it/

2. http://orientamento.educ.di.unito.it/course/view.php?id=49

- Entrare in 1 e fare login con credenziali di uno dei social network previsti

- Pigiare sul corso "Algoritmica per i licei"indicato in figura lucido successivo per iscriversi a quel corso

- segnalare inconvenienti a: commscuole@di.unito.it

http://orientamento.educ.di.unito.it/

SECOND MEETING

About Scratch: we work on the translations the students propose, see how the sequence of instructions and of selection I expressed in Scratch by considering the GoingHomeFromSchool Scratch project.

- **Step-1)** *As a recall of what we went through during our first meeting I ask if someone can tell other examples of tasks from our everyday life that we need to communicate quite precisely. One of my favorite and easiest example is the table: "What to do in case the alarm sounds" present in every school. The order of the actions is important.*

SECOND MEETING cont.

- **Step 2)** *we work on the translations the students propose: we introduce the recording possibility, we try to synchronize reading aloud the messages and how long the message is visible. Playing with longer messages we consider how to make them more readable, i.e. the need to have longer times for showing dialogues is introduced, which means also longer times for synchronizing the scenes*

SECOND MEETING cont.

- ***Step 3)*** *we analyse the language used to speak to the computer and introduce other forms of synchronization of the scenes.*

- ***Step 4)*** *we see the execution of the Scratch project GoingHomeFromSchool (also the inside?).*

   * yet no variables

SECOND MEETING cont.

- ***Step-5****) Quite similar to step-1 of First-m: I say aloud a sequence of numbers, they can be temperatures for example, the attendees have to find the highest and the lowest among them and, possibly, also their position in the sequence.*

  Attendees are not allowed to use paper but they are allowed to use their phones, they can work in groups of two or three. Again, only not to be confused, numbers are positive integers.

  – How many students use names as to register a new number? How many not?

SECOND MEETING last

Assignment: 1.translate another story, for example the Bacon&Egg story

  2. Learn ho to change the background and practice on the Nocturnal animals

Accomplishments: there are many "precise" languages, already seen flow diagrams and a pseudoLanguage: the Scratch language is the third one we see and this one is precise.

Why we write "precise" and not precise?

- Because they are precise only for some part

- For example using the diagrams the inside is not precise ……

- Languages precise in every component are also called formal